APR 29 1947

THE HORSELESS CARRIAGE CLUB

GAZETTE

FOUNDED NOVEMBER 14, 1937, LOS ANGELES, CALIFORNIA

VOLUME 9, MARCH, 1947 NUMBER 1

WHITE EXHIBIT - SEATTLE'S FIRST AUTO SHOW

SEE CENTER SPREAD PHOTOS OF WHITE CARS

THE HORSELESS CARRIAGE CLUB

...ed in Los Angeles - November 14th, 1937
... BOX 503, WEST LOS ANGELES 25, CALIFORNIA.
...on-profit corporation founded by and for Auto
...tive Antiquarians and dedicated to the preser-
...vation of the old time automobiles together with
their accessories, archives and romantic lore.

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By action of the Board of Directors of the Horseless Carriage Club, classes of membership and dues have been fixed as follows:

1. ACTIVE MEMBERS. Have privilege of voting. Dues for new members will be $10.00; $5.00 for Initiation Fee, and $5.00 for 1947 Dues.

2. ASSOCIATE MEMBERS. Have all the privileges of the Club except voting. Dues for new members in Southern California are $5.00; $2.00 for Initiation Fee, and $3.00 for 1947 Dues. Members living outside of Southern California pay $3.00 Dues, no initiation fee.

3. LIFE MEMBERS. Have all privileges of the Club including voting, for life, by the payment of $100.00 Dues.

4. HONORARY MEMBERS. Have all privileges of the Club except voting.

Minors, and Wives of members pay $3.00 a year Membership Dues and pay no initiation fee. Have all privileges of the Club except voting.

THE HORSELESS CARRIAGE CLUB GAZETTE

Official Publication of The Horseless Carriage Club.

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BACK NUMBERS

Prices of back numbers of the Gazette to members.

Volume 1, Number 1, Mimeographed Reprint	$1.00 ea.
Volume 1, Numbers 2 and 3	.75 ea.
Volume 2, Numbers 1, 2 and 3	.50 ea.
Volume 3, Numbers 1, 2 and 3	.50 ea.
Volume 4, Numbers 1, 2 and 3	.50 ea.
Volume 5, Numbers 1, 2, 3, and 4	.50 ea.
Volume 6, Numbers 1, 2 and 3	.50 ea.
Volume 7, Numbers 1, 2 and 3	.50 ea.
Volume 8, Numbers 1, 2, 3, and 4	.75 ea.
Volume 9, Numbers 1,	.75 ea.

Send orders for the Gazette to HERBERT ROYSTON P. O. Box 503 West Los Angeles 25, California.

DIRECTORS ELECTED FOR 1947

The Annual Business Meeting of the Horseless Carriage Club was held on Sunday afternoon, Feb. 16th, 1947, at the Automobile Club of Southern California building, in Los Angeles.

President Steadman G. Smith greeted the members and guests present, and gave his report on activities and accomplishments for the year of 1946. Following were reports by the Secretary, Treasurer, and various committees.

The principal business of this meeting was the election of fifteen Directors for 1947. The following members had been selected by the Nomination Committee: Lindley F. Bothwell, Clay Claberg, Louis Combs, Harry B. Johnson, A. S. Lewerenz, Tom Mathews, W. Everett Miller, Raymond E. Nelson, Herbert Royston, Ben Sharpsteen, George E. Shafer, O. J. Smith, Steadman G. Smith, Arthur E. Twohy, and Karl Weber.

No further nominations were forthcoming from the floor and, on motion duly made, seconded, and carried, nominations were closed and the Secretary was instructed to cast a unanimous ballot for the fifteen members nominated and the Board as so constituted was declared elected.

After the business of the afternoon had been completed, moving pictures were screened including a review of Club activities for 1946; a reel of pictures provided through the kindness of M. J. Duryea, Longmeadow, Mass.; showing views of the Glidden Tour Revival held in August, 1946; the Detroit Golden Jubilee Celebration in sound provided by the Automobile Manufacturers Association; and the Firestone Indianapolis "500" sound picture entitled: "The Crucible of Speed".

Articles appearing in The Horseless Carriage Club Gazette, contributed by members, express the individual opinions of the writers, and are not necessarily the opinions of the Editors. Permission is granted for reprinting articles appearing in this issue if credit is given to The Horseless Carriage Club Gazette.

The following account of a non stop run of a 1908 model Packard "30" from Los Angeles to Oakland California and return was taken from the account published in the Los Angeles Times Feb. 22, 1929. This car was placed on exhibition at the 1929 Los Angeles Auto Show (together with the Packard Factory's one cylinder Packard). The show was held in a huge tent at Washington and Hill Sts. The tent caught fire and the whole exhibit of cars was destroyed, including the two Packards. Some years later I purchased the chassis of this Packard "30" and still have it stored against the time when I have time to rebuild it.

Art Twohy

* * * *

ASK THE MAN WHO OWNS ONE

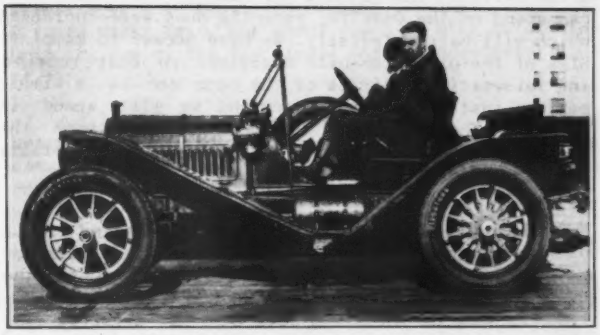
Roaring thru the night in an effort to establish a record non-stop wheel and motor trip from Oakland to Los Angeles, a 1908 model "30" Packard driven by Frank Randall, state service superintendent for Earle C. Anthony, Inc., who originated the idea of the run and perfected the novel refueling apparatus, checked out of a Western Union Office in Oakland.

A late Packard eight sedan (1929), equipped with a method of automatically refueling the lead car, followed the model "30" throughout the long grind. Contact was established to perfection except in the town of McFarland. Here the long arm of the law reached out and detained the old car thirty minutes while a ticket for speeding (at 58 m.p.h.) was written out.

Leaving the Earle C. Anthony, Inc. Building at the corner or Tenth and Hope Street in the Morning at 5:58 on Monday the 18th, the two cars set out on what was destined to be the greatest non-stop run ever attempted for a car the age of the model "30" Packard. With a new crew, Harry Smith and Frank Podas in the 1908 car, and Sam Marco and C. M. Bristow in the refueling car, the entire distance of some 900 miles was traversed without the wheels of either car coming to a halt.

Leaving Los Angeles in a blinding rain storm, old "30" did not need refueling until it reached the first grades of the Ridge Route at 9:28am when Podas signaled for the Packard Eight trailing behind him several hundred yards to approach and drop the novel towing bar into the eye bolt attached to the frame. Contact being established, Marco shut off his motor and was towed up the heavy grades at a speed of 41 miles an hour for the five minutes that the refueling consumed. On the Ridge Route, the rain, because of intense cold, turned into heavy snow which formed ice on the windshield of both cars adding further hazard.

One humorous feature occurred on Tuesday morning on the return trip when Anthony representatives were planning to meet the Question Mark Packard on the San Fernando Road with a motorcycle escort to bring it slowly into town and prevent its being stopped by traffic signals. Just as the cortege of officials was pulling away from the building it met the non-stop car, stopped for the first time in 900 miles by a highly irate police officer at Tenth and Figueroa Streets exactly two blocks from its starting point.



TWO VIEWS OF HARRY SMITH & FRANK PODAS IN THE 1908 MODEL "30" PACKARD THAT ESTABLISHED A NON STOP RECORD BETWEEN LOS ANGELES AND OAKLAND.

The recent non-stop run of a 1908 Packard model "30" from Los Angeles to Oakland and return, refueling in transit, was a notable accomplishment, and far beyond anything which was thought of at the time this Packard was new, it is said.

The car was driven through rain, snow, sleet, fog and sunshine for a distance of approximately 900 miles in 27 hours. Refueling was accomplished by a special device installed on a Packard 6-26 Standard eight, which enabled the big Packard to fill the tank of the old car at regular driving speed. Special service was given by the Standard Oil Co., whose Red Crown gasoline and Zerolene oil were used.

The total consumption of gasoline by the 1908 Packard was 82 gallons, or an average of nearly 11 miles per gallon.

OFFICERS FOR 1947 ELECTED

The first meeting of the new Board of Directors was held Thursday evening, February 27th, 1947. At this meeting officers for 1947 were elected as follows:

Lindley F. Bothwell, President
Geo. E. Shafer, Chairman, Board of Directors
Ben Sharpsteen, First Vice-President
O. J. Smith, Second Vice-President
Harry B. Johnson, Secretary

The office of Treasurer was not filled at this meeting.

GALLOP POLE*

The GAZETTE'S Editorial Staff is surprised, pleased, overwhelmed, and embarrassed by the answers received from the post card poll taken in connection with the last issue of the GAZETTE. All we can say, is "Thank You, Thank you, thank You". We have tried to do a good job for the members, but we had never before asked them if we were turning out what they wanted. Judging from the answers received, we have been doing just that; we don't claim second sight or anything of that nature. All the members of the staff really enjoy this work on the GAZETTE and you have now encouraged us to give you even better (well, at least "bigger" issues). The number of pages depends principally on the amount of money that the Club can spend on the GAZETTE; recently dues were increased which will help materially. We have access to complete files of the old automobile magazines so that reprinting interesting articles of the long ago is a simple matter; just give us the money and we will spend it for you. The Staff likes to spend it; we hope the Board of Directors won't object; anyway it generally is spent before they know it.

We believe that you will be interested in a summary of the results of the poll; 150 cards were returned, out of which only seven did not care for the reprinting of the old material from HORSELESS AGE, etc. However, some of the seven said they had a fairly good library of such material themselves. Others suggested that instead of reprinting the material, it should be listed according to source, so that those interested could go to the library and look it up. Well, how many libraries have a file of this early automobile history? Perhaps a very few of the larger cities have it, but it probably isn't available to one member in fifty, and then it could only be looked at. As the votes were 20 to 1 for reprints, we feel that publishing them is opening up a new field for many members, some of whom probably have never seen a HORSELESS AGE. Just try to buy one in second hand book stores; there aren't any. So much for that.

Elsewhere in the GAZETTE we reproduce examples of some of the answers received and which occasioned the first sentence in this article.

Now to answer some of the suggestions: Three members wanted more "ads"; suggesting a monthly swap sheet. Well, the Editors know ads are interesting, but we can't print them, unless they are sent in by members, so if you have something to sell or want to buy, send in the memo. Many members say this is the department that they read first.

By far the greatest number of requests was for pictures of member's cars. We will be glad to enlarge this department, so send in your pictures and show the other members your prized possessions. Reproducing pictures adds considerably to the cost of the GAZETTE as all photos have to be "screened" before they can be used, but if that is what you want, we are for it, even if we have to scrap with the Board of Directors about the money we are spending. We like to spend it, or did we say that before? Make the pictures as large as possible—even 8x10 is not a bit too large; glossy prints and car pictures taken against a plain background are best. We will print them if you send them in.

* This was quite intentional!!! (footnote refers to the title,

Don't kick about predating cars; we don't like it either, but we don't want to scrap with a member about the year of his car; he might get so that he doesn't like us, and we wouldn't want that. Guess we will have to cover it with that old comment, "Opinions expressed herein are not necessarily those of the Editors"... or something like that.

We had one request for an article and pictures of David Gray's cars. Fortunately he was down here from Santa Barbara last Saturday and "we" (editorially) asked him to do it. He said he couldn't write but would send a lot of pictures, so you can look for at least pictures of his cars in a GAZETTE later this year. David has sold quite a number of his cars and says he will eventually get down to half a dozen.

Nine members liked the article on steam cars while two objected to it as not having enough general interest. However, some members want us to publish an article on modern steam car design. Well, this would be quite beyond us; maybe one of Clymer's books is the answer.

We had a number of requests for articles by members about their cars, their experiences in acquiring them, etc., etc., etc, Well and good, let's have the stories. Writing a story interesting to others comes easier to some; we would be glad to have articles sent in; we promise to use the blue pencil as sparingly as possible. Make them short, however. We suggest that you write it, then sleep on it for a couple days and see if it still sounds O. K. Incidentally, wives are pretty good at correcting manuscripts; they "just love to do it"; this particular one that you are now reading "went through that wringer".

We particularly would like to have articles written by the pioneers; we are taking this up with several of them and if we can prevail on them to write for us, we will be very pleased to print anything that they record. A. L. Dyke, George Dorris, E. Paul DuPont, Thomas M. Galey! the Editor is looking right at you.

Many suggestions were received, most of them are going to be adopted. For instance, one member wanted an article on Electrics; that sounded like a good idea so we have commissioned Mr. Jamison Handy, Jr., to do an article for us on the subject. With his knowledge of this branch of the hobby, we know it will be all right. Why don't you members who are also interested in electrics write Mr. Handy and pool your knowledge?

Another request was for racing pictures; very fortunately member Albert Mecham wrote in offering to make available his famous collection of photographs and we are now in the process of borrowing a series of his racing pictures for a later GAZETTE.

We had several requests on how to repair old cars, but on that we have to give up. Best we can do is to refer such members to the old time books on the subject, such as Dyke's "Automobile and Gasoline Engine Encyclopedia", Page's book entitled "Automobile Repairing Made Easy", Homan's "Self Propelled Vehicles" etc., etc., etc. After all, these early gasoline cars were simple affairs and a good all around mechanic should have no trouble fixing them up. If you are talking White Steamers, however, that's something else.

We had one request for an article on the "White Streak Buick" and as that is a very sensible request,

the Buick Editor of the GAZETTE will be glad to oblige with a story, probably in the next issue.

Another member requested an article on later models, 1909 to 1915. Well, we will get around to that also; takes time though. If we did it too quickly the Editors would be out of a job, and they wouldn't know what to do with themselves Saturdays, Sundays, and a couple evenings each week that are now spent on the GAZETTE.

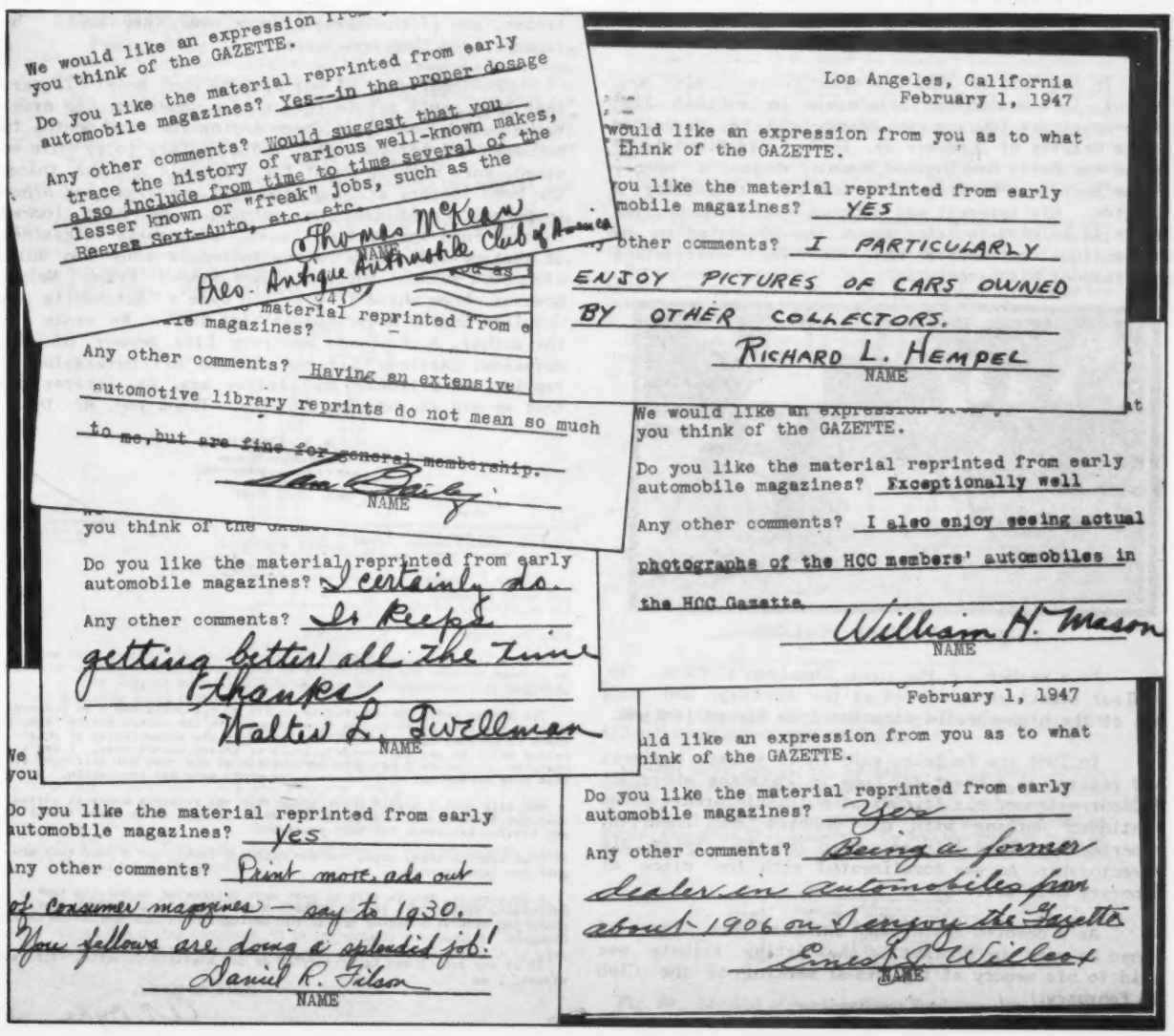
Another group of members requested "articles on trips". We take this to mean articles from the old auto magazines, describing tours made forty or so years ago, with all the now unheard of troubles; mud, mud, mud, scaring horses, arrests for driving faster than 8 miles an hour, blow-out after blow-out, driving 40 miles on the rim, hills too steep for low gear, turning around and backing up the grade, steering knuckles breaking, etc. etc. There is a wealth of these stories in the back files of early automobile magazines and for this issue we have selected several that the Editors enjoyed reading. We hope you members do, too. We can publish more of them, if wanted. We strive to please the cash customers, now that the war is over.

Several members asked if we could do something about using larger type. This is being given consideration. Of course, when we reprint pages from the old magazines, we have to fit the type and page size of the original article to ours, but where material is typed for the GAZETTE, we have a full choice of size. If we increase the type size, there will be less reading matter. We are trying to strike a happy medium.

This is a good time to close, but may "we" say one thing more; some of the requests quite baffled us. One member said, "How about more literature on Horseless Carriages and early model cars?" Another member wrote, "Individual ideas how a gasoline powered car should be built, also a modern steam powered car should be built." A third party said, "How about plans or blue prints for building one of the old simple one cylinder cars, 1904 or so?"

Well, "Thanks for a wonderful time;" we enjoyed hearing from all of you. We will do the very best we can. We plan to make the future GAZETTE as near to what you want as possible.

The Editorial Staff.



We would like an expression from you as to what you think of the GAZETTE.

Do you like the material reprinted from early automobile magazines? Yes--in the proper dosage

Any other comments? Would suggest that you trace the history of various well-known makes, also include from time to time several of the lesser known or "freak" jobs, such as the Reever Sext-Auto, etc. etc.

Thomas McKean
NAME

Pres. Antique Automobile Club of America

Los Angeles, California
February 1, 1947

would like an expression from you as to what think of the GAZETTE.

you like the material reprinted from early mobile magazines? YES

other comments? I PARTICULARLY ENJOY PICTURES OF CARS OWNED BY OTHER COLLECTORS.

RICHARD L. HEMPEL
NAME

material reprinted from e

Any other comments? Having an extensive automotive library reprints do not mean so much to me, but are fine for general membership.

NAME

you think of the GAZETTE.

Do you like the material reprinted from early automobile magazines? Exceptionally well

Any other comments? I also enjoy seeing actual photographs of the HCC members' automobiles in the HCC Gazette.

William H. Mason
NAME

Do you like the material reprinted from early automobile magazines? I certainly do.

Any other comments? It keeps getting better all the time

Thanks

Walter L. Twellman
NAME

February 1, 1947

ld like an expression from you as to what hink of the GAZETTE.

Do you like the material reprinted from early automobile magazines? Yes

Any other comments? Being a former dealer in automobiles from about 1906 on I enjoy the Gazette

Ernest J. Willat
NAME

Do you like the material reprinted from early automobile magazines? Yes

Any other comments? Print more ads out of Consumer magazines — say to 1930. You fellows are doing a splendid job!

David R. Gilson
NAME

CLUB DIRECTOR CALLED BY DEATH

August L. Pouleur, a director of The Horseless Carriage Club since 1940, passed away in Pasadena on February 14, 1947, after an illness of several months.

Mr. Pouleur was born in Montreal, Canada, on March 25, 1877. At the age of five he came to the United States with his parents, who settled on a farm in Connecticut. Here he spent his boyhood working on the farm and attending school until he left to enter Harvard University where he majored in Chemistry and graduated with the class of 1906. His schooling was concluded with a postgraduate course at New York University.

That he followed his career as a chemist is related in an article by Mr. Pouleur in the Gazette of November 2, 1940. Much of it concerned his work as supervisor of the installation of laboratories for automobile concerns such as Oldsmobile, Auto Car, and E. R. Thomas Co.

Then followed a goodly number of years as professor of chemistry at the University of Iowa, University of Buffalo, New York University, University of Maine, and fourteen years as head of the chemistry department of Wheaton College, Newton, Massachusetts.

In the fall of 1932 Professor Pouleur, with Mrs. Pouleur, left Boston for California in a 1913 Fiat seven-passenger touring car, which trip he described in the Gazette of December 25, 1944. In Glendale he opened the Early New England Museum, became a member of the Horseless Carriage Club and soon thereafter a director. His interest was intense and his successful efforts in helping to bring about the preservation of the antique automobile won him the everlasting gratitude of his associates.

AUGUST LAWRENCE POULEUR

As a member of the Old Wheelman's Club, Mr. Pouleur sometimes exhibited at the meetings and rode one of the high-wheeled bicycles from his collection.

In 1946 the Pouleurs sold their antique business and retired to a beautiful home in Pasadena where Mr. Pouleur welcomed his friends of mutual interests as he continued working with his hobbies and chemistry experiments. When illness caused him to resign his directorship, he was complimented with the office of Honorary Life Director.

As a devoted member who enriched the lives of those he came in contact with, fitting tribute was paid to his memory at the annual meeting of the Club in February.

SAINT LOUIS REGIONAL GROUP ELECTS OFFICERS FOR 1947

The St. Louis, Missouri, Regional Group of The Horseless Carriage Club met on January 21st, 1947, at the home of Honorary Life Member Mr. George P. Dorris, for the purpose of electing officers for 1947. Director A. H. Deeken called the meeting to order at 8:00 P.M.

The following officers were elected:

A. H. Deeken - Director
Henry Carpenter - Asst. Director
Herbert Restetsky - Asst. Director
Wayne Bledsoe - Secretary Treasurer

by Wayne Bledsoe, Secretary

* * * * *

REMAGNETIZING MODEL "T" FLYWHEEL MAGNETS

In the old days when Ford dealers sold and serviced Model "T"s you could get your flywheel magnets remagnetized without having to tear down the transmission etc., to get to them. They all had a Ford Magneto tester, and if the magnets were weak, they could be remagnetized then and there.

No doubt some of our members have Model "T" cars that they can't get to run on the magneto; in order to help them, we have been trying for some months to run down the information. Ford dealers today whom we asked, knew nothing about the principle of the thing; the Ford factory at Long Beach and even the head office in Detroit could tell us nothing. We have looked through Ford instruction books, automobile magazines of that period, books on how to repair your own auto, etc., etc., without success. New member Frank Meier, however, knew where it was---in Dyke's "Automobile and Gasoline Engine Encyclopedia" for 1927. We wrote to the author, A. L. Dyke, Honorary Life Member of The Horseless Carriage Club and secured his permission to reprint the article. His letter was so interesting that we are reproducing it also. Thank you, Mr. Dyke.

A. L. DYKE
406 MARKET STREET
SAINT LOUIS 2, MISSOURI

Feb. 26th, 1947.

EDITOR
DYKE'S AUTOMOBILE & GASOLINE ENGINE ENCYCLOPEDIA
DYKE'S AIRCRAFT ENGINE INSTRUCTOR
DYKE'S CARBURETOR SUPPLEMENT
DYKE'S SELF-STARTER

(VIA AIR MAIL)

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Mr. Arthur E. Twohy,
400 North Kenmore,
Los Angeles 4, Calif.

Dear Mr. Twohy:

This will acknowledge receipt of your letter of February 24th and I am pleased to have the opportunity of supplying you with additional pages 1117 and 1118 in order that you can keep your book intact.

The writer holds the copyrights on all of his books and I am pleased to give you permission to use these pages with the understanding that there is no come back on me in any way as to the authenticity of this method which is not the writer's tried or proven experiments. I don't remember just where I got this information at the time but evidently it must have worked out o.k. otherwise we would have had complaints.

You will note I pasted white paper over the footnote where it states that the testers, etc. can be secured of A. L. Dyke as we haven't handled any testing equipment for many years.

I am sending these pages via air mail Mr. Twohy, and I hope they are what you have in mind.

I am sure Mr. Dorris will be very much interested in knowing that I received a letter from you as we have both spoke of you several times and think you deserve a lot of credit for having started the Horseless Carriage Club.

If at any time I can be of service do not hesitate to write. With best wishes, I am

Yours Cordially,

A. L. Dyke

D/E

Adjusting air-gap clearance: The clearance, or air gap, between the coils and magnets should be .030", which is almost 1/32". The allowable limits are from .025" to .040". **If the gap is too wide,** put the necessary shims behind the coil support. **If the gap is too narrow,** take out some shims. The steel shims are .015", and the paper ones are .005".

If the needle fails to reach this mark, remagnetize the magnets.

If then the magneto fails to test up to this mark, and the missing still occurs, and is not due to loose terminals, and **runs satisfactorily with a battery,** then you may know you have a "grounded" magneto coil. The magneto must be removed, the defective coil located, another put in place, and the "air-gap" clearance must be given as described above.

Remagnetizing Ford Magnets

There are various methods of remganetizing Ford magnets. The usual and proper method of remedying weak magnets is to replace them with new ones. The Ford Co. does not advise everyone to attempt this work. This however necessitates taking down the engine and then reassembling. This makes a costly job, and is a big job. Therefore different methods of recharging magnets without removing them from the car will be given.

Remagnetizing by electromagnet and battery: It is not necessary to remove the flywheel from the engine when remagnetizing Ford magneto magnets with the device shown in Fig. 94. Simply remove the transmission-case cover so that the ends of the magnets are available. Use a compass to determine the N pole of each magnet, and chalk them; also chalk the S pole of the remagnetizer. Place the S pole of the remagnetizer so that it will be on the N pole of the magnets.

Turn the flywheel over after remagnetizing one magnet, and remagnetize each magnet separately.

After remagnetizing, check the polarity of all magnets with the compass again.

The connections are shown in Fig. 94. The storage battery can be either a 6 or 12-volt battery. It is possible to use 6 or 8 dry cells, if connected as in Fig. 95.

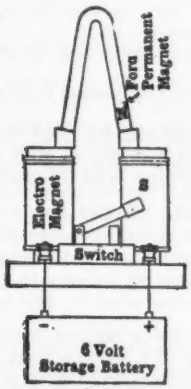


Fig. 94. Electromagnet using a storage battery for remagnetizing Ford magnets.

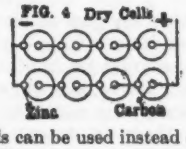


Fig. 95. Dry cells can be used instead of a storage battery, if connected as shown.

Magnets of all types of magnetos can be charged with this remagnetizer. When remagnetizing magnets which are separated from the magneto, it is important to place a "keeper" across the magnets until placed on the magneto. It is also advisable to rap the magnet a few times with a piece of wood while being remagnetized. See also page 312: "Remagnetizing Magneto Magnets."

Remagnetizing with storage batteries: Five or six, 6-volt storage batteries should be about right. Refer to Fig. 96.

To prepare the magneto for recharging, first disconnect the wire (A) which goes from the magneto terminal on the transmission cover to the coil on the dash.

Next remove the transmission cover (B), so that you can look at the magneto. Locate the brass studs on the rim of the fly wheel which hold the magnets in place, and have someone turn over the engine very slowly until one of these brass studs is in line with an imaginary line drawn about 1" or so from the magneto terminal, to the left of the latter and paralleling the frame.

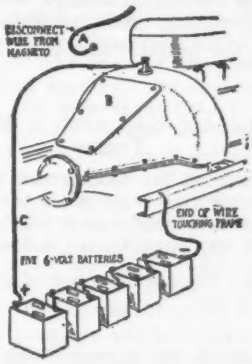


Fig. 96. Remagnetizing Ford magnets with storage batteries.

Another method is to place an ordinary small compass on the transmission cover about 1" from and to the left of the magneto terminal, at the same time turning the engine slowly until the needle of the instrument is parallel with the engine.

The N pole end of the needle should point toward the engine when in this position.

Connections: Connect a wire from the positive (+) terminal of the battery to the magneto terminal on the engine, as shown at (C) (Fig. 96).

Next connect a wire from the negative terminal on the battery, and make and break the circuit by striking the free end of the wire on some metal part of the engine.

Permanent connection should not be made, but only thirty or so momentary contacts, which, it is said, will recharge the magnets much more satisfactorily than if permanent contact is made. (*Motor Age.*)

Dry cells can be used if necessary. Use 48 connected in series-multiple, as shown in Fig. 97. Connect the positive (+), or carbon poles, with the terminal.

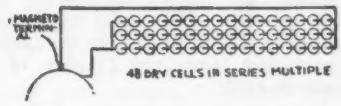


Fig. 97. Remagnetizing Ford magnets with dry cells.

Resistance wire can be used. Use 13 ft. of nichrome No. 16 wire, or 8 ft. of No. 18. If German silver, use 35 ft. of No. 16 or 22 ft. of No. 18—in series, as shown in Fig. 98.

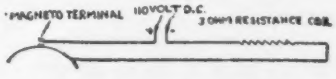


Fig. 98. Method of remagnetizing Ford magnets with 110-volt direct current and resistance.

110-volt direct current can be used. To use this it will be necessary to use a resistance lamp bank, as shown in Fig. 99. Use twenty-eight 32 c.p. carbon filament lamps. Connect the positive pole with the magneto terminal. Connected as shown, this gives 27½ amperes. To find the positive pole, or polarity of any circuit, see page 564, "Polarity, how to find."

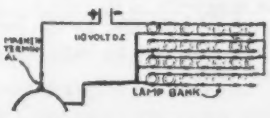


Fig. 99. Method of remagnetizing Ford magnets with 110-volt direct current and lamp bank.

10. Slide the transmission housing in place. Using a screwdriver, pry the bands into place.
11. Knock the housing down flush, and tighten the two rear retaining bolts.
12. Using a thin socket, or check-nut wrench, tighten the transmission bands.
13. Replace the balance of the housing bolts, and bring them up snug.
14. Slide the rear axle and drive shaft back into place, and secure them there.
15. Assemble the engine fittings, such as fan, commutator, wiring, and manifolds.
16. Replace the radiator assembly, hood, and floor boards.

To Test the Air Gap with a Ford Magneto Tester

Another method for testing the strength of the magneto, which also determines the air-gap space, can be found very easily with the **tester** shown in Figs. 91 and 93, as explained below.

To test the air gap space and strength of the magneto on a car:

1. Test the output of the magneto with the tester (Fig. 91), with the engine running at moderate speed.
2. Remove the transmission cover and place a thickness gauge, 1/32″, between the magnet and the coil core. If the gap is 1/32″, but the magneto has tested out as **weak,** the magnets need recharging.
3. After remagnetizing the magnets (which can be done without taking the engine down; see below), test the magneto again with the engine running at moderate speed. The tester should show **strong;** if it does not, the probabilities are that the magneto coil is short-circuited.

If some of the magneto coils become short-circuited, or if the magnets are weak, the tester will read low. In other words, it tells you instantly, without removing the magneto from the engine, if the magneto is in proper condition. If not in proper condition, it is time to take the magneto out and to remedy the trouble. If it tests satisfactorily, it is time to look elsewhere for the trouble, and you will thereby save the time and trouble of removing the magneto in error.

The meter scale is very simple. It has two readings (see Fig. 91). One is marked "1914," meaning that on all magnetos before 1915, the needle should come to this mark. The other is marked "1915," meaning that on all cars after 1915, the needle should reach this mark. (The Ford magnets were enlarged in 1915.)

Example of a Ford Magneto Tester[1]

The Ford magneto generates "alternating" current. An ordinary "direct"-current ammeter, as used for testing batteries and generators, will not operate. Therefore a special meter, as shown in Fig. 91, is designed for testing the Ford magneto.

If the engine will not run at all, and the ignition is the fault, an easy way to determine if the trouble is due to the magneto, is to connect a storage battery, or five or six dry cells, to the battery side (**B**) of the coil (Fig. 92), and to turn the switch to (**B**), or to the right side.

If the engine then starts, and runs satisfactorily, but will not **start on the magneto,** with the switch to the left, or (**M**) side, you may know that the magneto is not supplying current. This may be due to dirty or loose magneto terminals (**T**) or to a weak magneto, due to weak magnets, or to grounded magneto coils.

Fig. 91. Ford magneto tester. Note how the scale is marked. See text.

The Ford magneto can be tested with a special magneto tester, as shown in Figs. 91 and 93. This instrument is nothing more than an ammeter, but one provided with a "reactance coil" (**R**) (Fig. 93), which enables the meter to indicate a constant current at all engine speeds. In other words, the meter is so designed that it will indicate if the magneto is giving its proper output at any speed of the engine, while testing.

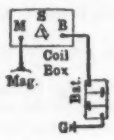


Fig. 92

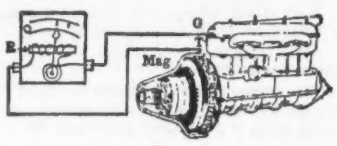


Fig. 93

Fig. 92. Method of connecting the battery to the ignition coils.

Fig. 93. Method of connecting Ford tester.

This instrument can be used to test the strength of the magneto while the engine is being run on a battery, if the engine fails to start on the magneto.

If engine starts on the magneto, but continually misses, and if the trouble is not due to other causes, then the tester can be used to see if the magneto is delivering its proper current, while the engine is being operated on the magneto.

The connection for testing would be the same in both cases (Fig. 93), except that, when the engine is running on the battery, the wire from the ignition coil to the magneto is removed, and the switch is placed on (**B**) side (Fig. 92).

The clearance or air gap of Ford magnets is the distance the magnets are from the core of the magneto coils. This should be as stated on next page. If they are farther away, the amperage and voltage will be less; if closer, the amperage and voltage will be greater, but there is danger that the magnet will strike the coil core.

The tester is a great help when assembling the magneto on the bench. The "air-gap" can be adjusted to the point of greatest output, if you have the meter to test with as you assemble. The flywheel can be turned by hand fast enough, so that the instrument will give a steady reading.

HORSE vs. THE HORSELESS CARRIAGE

In the December 1946 issue of the GAZETTE we had the story of the Winton. One of the cars mentioned was the one cylinder with tiller steer that I purchased from E. B. Waterman a good many years ago and which is now in the Lindley Bothwell collection. Lack of space prevented reproducing the picture of this car at that time. A story concerning this car by Ransom Matthews was printed in the November 2, 1940 GAZETTE which we are reproducing below for the benefit of new members.

Art Twohy

GET A HORSE

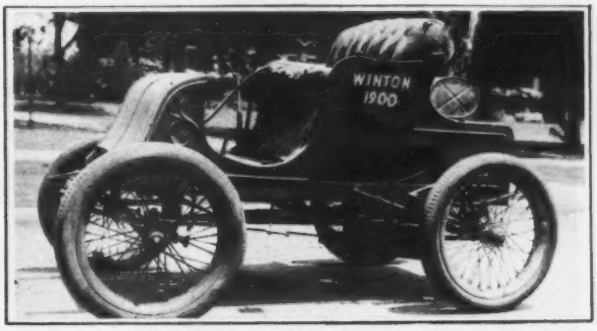
by Ransom Matthews

Art Twohy has been after me for a long time to write about the time his one cylinder Winton almost beat a horse in a race from Selma to Fresno. That Winton may even be one of the foundation stones of the Horseless Carriage Club, because if he hadn't bought it, I might not have met him, and if I hadn't met him he might not have been such an ardent collector, and if he were not such an ardent collector, he might not have met Everett Miller and William Wakefield, and if he hadn't met Everett Miller and William Wakefield there mightn't have been any Horseless Carriage Club and wouldn't that be awful. But gosh, I got clean off my subject. Oh, yes! Once upon a time, that is about 1900, E. B. Waterman of Fresno had the Winton agency and imported the car under discussion into sunny California from far away Cleveland. After a year or two it was sold to an uncle of mine, Mr. T. J. Neese of Fresno, who one sunny Sunday sallied forth to brave the fifteen miles of sandy road that stretched out between Fresno and Selma (all in our glorious California). In due time but without undue hardships or suffering, he and his wife arrived at their destination, my father's home near Selma. There they found Uncle Albert Johnson and his wife, also from Fresno but who had arrived by means of an humble hay burner. Let me say in defense of the hay burner that he was a big high-stepping sorrel, well able to negotiate the fifteen miles of sandy road in from one hour to an hour and a half with Uncle Albert's little wire wheeled, rubber tired, ball bearing buggy. What a museum piece that little buggy would be today with its cream color umbrella top and gay red paint with black trim! And I can still see the russet leather harness with the mahogany knobs on the reins for a good grip in holding back a too eager horse.

The horse and the automobile proponents exchanged good natured left-handed compliments both before and after imbibing one of my mother's chicken dinners, or I guess it was chicken. It is so long ago that my memory is a little clouded, but that's what it probably was. Anyway, both contenders set sail for Fresno about the same time with the horse a little in the lead, but the iron lunged monster soon passed him to the accompaniment of great hiliarity among the automobilists in their dusters, goggles, and veils. This triumph, however, was short lived as old Prince soon trotted by a very quiet Winton while its owner hunted in the deep sand for missing links. (Oh no, I don't mean the links between man and monkey. I mean chain links.) When these were found and properly spliced, the Winton plunged ahead at the breath-taking pace of twenty miles per holr and shortly showed old Prince that it didn't have to stand for any horse laugh, but the Johnsons soon found it standing again for the want of a continuous chain while the horse went gaily on by. I don't know just how many times this passing and repassing went on but the horse reached Fresno first.

After being traded back to its original owner, The Winton served many years as a shop and tow car. I tried several times to buy it but always found the price too high. When I came to the Los Angeles Museum I tried to get it as a gift to the museum, as I had been able to do with the Welch car of which I wrote in Vol. 1, No. 3 of this Gazette, but in answer to my letter I learned that the car had just been sold to a lumber man in Los Angeles. Being a persistent soul, I wrote back for the address of this lumber man, thinking that he probably just wanted it for an advertising stunt and would soon tire of it after which we might get it for the museum, but, of course, I did not know that scotchman, Art Twohy, as I do now. Anyway, the Winton introduced us, and though the thought of the ten thousand dollar insurance on the one cylinder Packard that was burned in the 1929 Auto Show started him to collecting old cars as an investment, I think I woke him up to the possibilities it held as a hobby.

I drove the Winton in the parade of old cars at the time of the 1930 Auto Show and had the scare of my life when I went to stop it in a down-town garage when I took it back. It has individual clutches for low, reverse, and high gear, with the low and reverse operated by one lever and the high and a brake operated by the other lever. (I think this is right, though it has been ten years since I drove it.) Anyway, I had it in low gear and was headed toward a big Pierce Arrow. When I went to pull it out of low gear I broke the lever off, but the car was still in gear and I had a useless broken handle in my hand. I had visions of wrecking a two hundred dollar radiator on the Pierce, and I know the garage man was thinking of the same thing. There was no time to grope for the switch. However, in place of the original coil, which had probably been under the body or in the plow-share dash, they had used an old Ford coil which was fastened to the dash board with a piece of wire. Rather than fumble for the switch I gave the Ford coil a good swift kick which nearly broke my big toe but pulled the coil from its moorings and sent it spinning across the garage. Then with all the force I could apply to the hand and foot brakes I waited for that big flywheel to stop spinning. It seemed as if it never would stop, but it finally did, and the Winton still lacked a couple of inches of hitting the Pierce Arrow radiator.



THE WINTON THAT RACED A HORSE

THE 1900 WINTON, WHICH FIGURED IN THE RACE DESCRIBED BY RANSOM MATTHEWS. IT NOW BELONGS TO GLENN E. THOMAS, OF LONG BEACH, CALIF.

The Horseless Age

First Automobile Journal in the English Language

VOLUME XXI | NEW YORK, MARCH 25, 1908 | NUMBER 13

Extraordinary Test of Interchangeability.

By Roy Lindsay.

Many manufacturers make the claim in their catalogues that all parts of their machines can be replaced from stock upon demand, and while such statements are doubtless true enough in respect to the supply end, it is altogether another proposition when a car owner attempts to fix a particular piece in position and finds it too small, too large or requiring considerable more filing up and machining before it will really fit. Of course, where it is a matter of replacing considerably worn parts it cannot be expected that absolutely new portions will fit perfectly to contiguous parts that have not been subjected to such wear, and a reasonable amount of hand fitting is then essential. This fitting together ought not to be of the character such as would make it an equally quick job to manufacture the new piece throughout on the spot, as to send to the factory for a replacement and spend any number of hours after it arrives in endeavoring to make a practicable job. To the user of a machine who does much touring it must be a source of comfort to know that in case of any serious breakdown he has but to telegraph to the factory and receive by train what he needs, with the assurance that it will fit. With the object of proving to the buying public that their claims in regard to the arguments set out above are strictly true and not merely paper talk, the British agents of the Cadillac car have recently arranged one of the boldest schemes it is possible to imagine. The writer of these words believes he was primarily responsible for the idea, that he suggested it to F. S. Bennett (who runs the Cadillac headquarters in London) some time in October, but hardly with the belief that the proposal would be entertained. However, negotiations were entered into with the Royal A. C. to see if it could be carried out under official supervision and observation. The proposals for the test were placed before the technical committee of the R. A. C, and after mature consideration the members of that influential body decided to give their sanction, provided that certain rules and regulations they laid down were complied with to the minutest detail.

On February 29 the members of the technical committee, together with the R. A. C. engineer and his assistant, proceeded to the Cadillac show rooms in London, and from the eight new cars then standing on the floor selected three. None of these machines had been in England or tested in any way on this side, no gasoline had been put in the tanks and they were exactly in the condition when they were packed into their crates at the factory in Detroit. As soon as the selection was made, charged accumulators were placed in position, the wires connected up and the machines wheeled into the street, the gasoline tanks then being filled up, together with the oil reservoirs. Two of the machines had the engines started at the first pull over of their starting handles, and the third machine only required two cylinder charges before its engine also fired. Official observers of the R. A. C. mounted beside the drivers, and the cars were immediately driven through the thickest throng of London traffic to the Brooklands racing track at Weybridge, 23 miles distant, without any stop. Upon arrival at the track inclosure, large numbered cards were affixed to each vehicle and they were driven for ten laps around the track, equal to 27 miles (making a total of 50 miles in all), each machine being officially timed for each lap, so as to obtain a comparison of performance with track tests to be made later.

And now commenced the real business, or rather, the next morning, for the machines were locked up that night in private and separate garages in the track grounds, their own padlocks being used by the club officials, who held the keys. The next morning two mechanics started to pull car No. 1 to pieces in its particular shed, and so completely was this accomplished that no two parts of any section that could possibly be separated were allowed to remain together. What this meant could only be appreciated by viewing what looked like the wreck of this car after midday, and to see the pieces and bits spread about the floor was a revelation as to the multiplicity of components

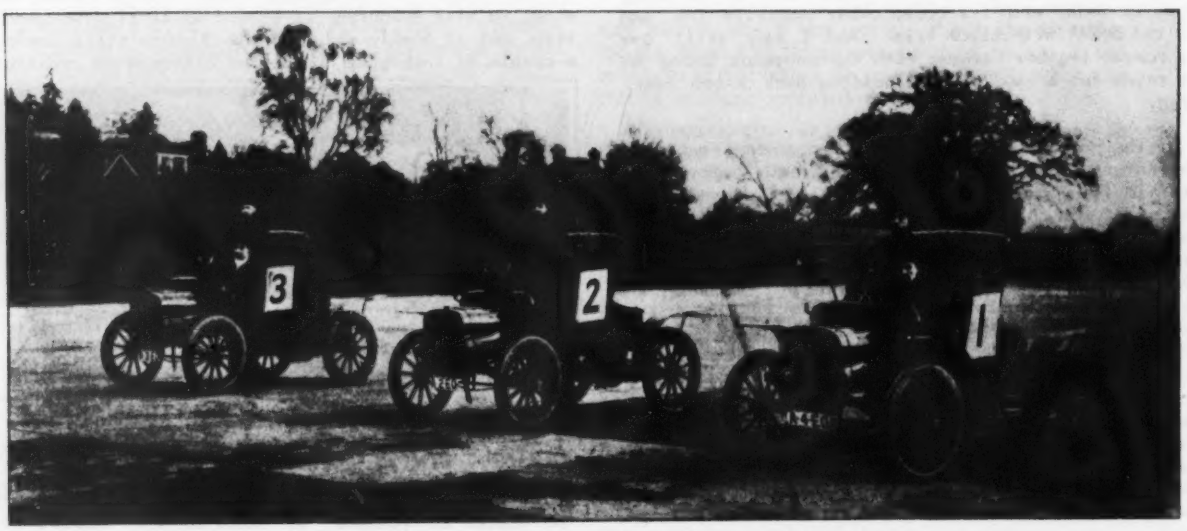


Fig. 1.—At Brooklands, Starting for the Twenty-five Mile Run.

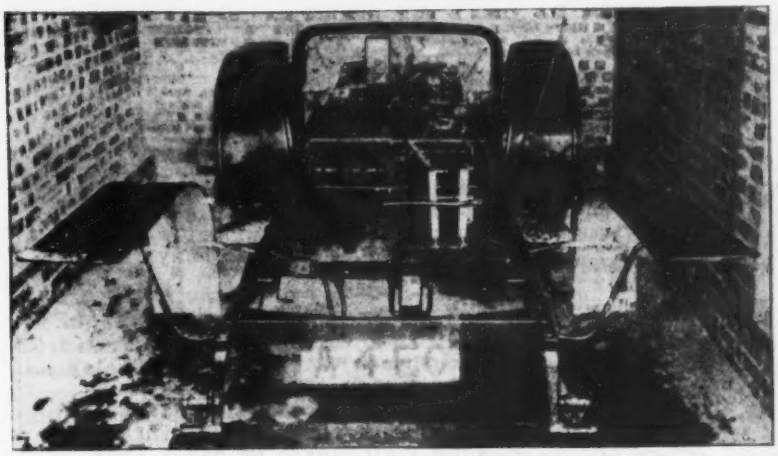


FIG. 2.—CAR NO. 1 DISMANTLED.

that go to make up a complete vehicle. It must be clearly understood that the disassembling was absolute, even to the taking out of split pins whenever they were employed; for instance, after the engine was taken apart, the piston rings were eased off the piston, the piston pin was taken out of the piston, the bearings were removed from the connecting rod, all screws, nuts and washers were separated, etc. The same plan was pursued throughout for engine, gear box, clutch, transmission, rear live axle, steering gear, wheels and steering column, even the wheel being taken off the latter. When the dismantling was complete the club engineer searched all over the parts, and before he locked shed No. 1 up, the chassis frame was flat on the ground, springs and dumb iron and all connections also being removed. Then the other two cars were treated in the same fashion, still with the same mechanics, and when at the end of two days all three were dismantled, the whole of the parts were taken into one shed and mixed indiscriminately together so that it was impossible for any person to discover the parts of any one car.

On March 5 the members of the technical committee attended and witnessed the commencement of the reassembling, for which the two mechanics were only allowed to use wrenches, screwdrivers and pliers; the committee themselves picked out the parts asked for by the mechanics, and when these were separated, the "mixing" shed was locked up. The mechanics started at 11:45 a. m. and worked till 5 p. m., when shed No. 1 was locked up. During the night rain fell ceaselessly and next morning the concrete floors werre found flooded to the depth of 3 inches with water, and before operations could be resumed this had to be pumped out. Such a mishap was quite unlooked for, and was most unfortunate, everything being covered with red rust. To comply with the requirements of the R. A. C. the four locked up garages that were used had, prior to the test, been cleaned out so conscientiously that not even a nail remained in the walls on which anything might have been surreptitiously placed, and the officials would not allow a workbench or trestles for the same reason. Hence all the parts had to be laid on the floor. By dint of hard work one car was entirely completed by the evening of March 6, and the observers and press men present eagerly awaited to see what would happen after some gasoline was poured in the tank. At the first turn of the starting handle the engine revolved, and F. S. Bennett was heartily congratulated. The second car was completed in the same manner.

The tests so far were onerous enough, but to complete the third machine something still more stringent had been stipulated by the committee. When the parts of the three cars were mixed, certain of them were picked out, placed in a box and taken right away, and these had to be replaced from the stock of spares held in the stores at the Cadillac depot in London. Appended is the list of parts demanded by the R. A. C. from the Cadillac stores:

One Sun pinion.
One near side knuckle.
Two cones and adjustment with locking device.
One spark plug clamp and set screw.
One pump cover.
One pump impeller.
One pump gland nut.
One pump driver with set screw, two one-quarter inch bolts and cuts.
Three pump joints.
Flywheel side main bearing cap.
One oil pipe nipple connection.
One half main bearing.
Two dowels.
One air vent pipe.
One exhaust valve rocker spindle.
One grease cup.
Eight outside rollers and cage.
One back axle distance piece.
One piston.
Three piston rings.
One connecting rod.
One piston pin with locking plug.
One small end brass.
One exhaust valve.
One exhaust valve spring.
One exhaust valve cap and pin.
One exhaust valve rocker.
One rear wheel axle key.
One high speed thrust ball race.
One commutator casting.
One commutator fibre.
One ground spring.
One commutator adjusting screw and guide pin.
One Whitney key and pin.
One gear thrust washer.
One high speed clutch plate.
Eight leathers and rivets.
One high speed ball race sleeve.
Eight five-sixteenth inch screws for same.
One reinforcing plate for friction disc.

FIG. 4.—REMAINING PARTS OF THREE CARS AFTER ONE SET TAKEN OUT BY COMMITTEE.

"JUMP IN, BINKS, AND I'LL SHOW YOU HOW FAST SHE CAN GO."
"I D-D-DON'T CARE TO G-GET IN, THANKS, BUT I'LL STAND HERE AND H-H-HOLD MY BREATH AS YOU GO BY."

From Vic Paulsen, San Francisco—

"It seems that somewhere along Van Ness avenue, on the upper floor of a building owned by some automobile agency, an old, very old, Stanley steamer is stored. The old buggy is jacked up, air removed from the tires, and under canvas. According to the story, the steamer is owned by a very elderly and wealthy gentleman who drove the Stanley when he was much younger, and developed such an affection for it, that he couldn't bear to part with it. About once a year, the automobile agency receives a telephone call, instructing them to put the Stanley into shape, which they do. Air is put into the tires, the burner is fueled, the boiler is watered. The old gentleman then makes his appearance. He climbs into the Stanley, runs her back and forth a few feet, as much as the floor space will allow. Then he leaves, and the old steamer is once again jacked up, and there it remains until he feels the urge to take another spin."

From a Berkeley lady who didn't want her name used, because now,

THE HORSELESS AGE

Petroleum or compressed air,
Ingenious spring power or benzine,
Help the wheels to speed us there:
Carbonic acid, kerosene
Naphtha, ether, gasoline,
Charcoal, coke, acetylene,
Storage batteries or steam,
With such rivals it is plain
Debbin will not reign again.

C. M. Lewerenz

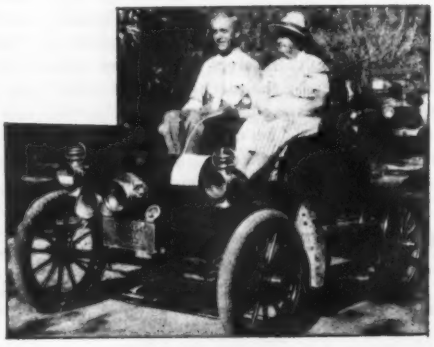
November, 1946

Dear Mr. Royston

Dear Friend:

Mrs. Green and I were glad to receive your letter and are sorry that we have been so long in answering. We would like to thank you very much for the tickets to Breneman's broadcast. We had a fine time and many people on the way home mentioned that they had heard us on the broadcast. The people around home got a big kick out of hearing us. I had no idea so many people listened to the program.

We arrived home September 23rd -- 13,278 miles -- its a big country when you travel 20-25 miles an hour. From Los Angeles we went down into Death Valley, up the Valley and out to Beaty, Nevada. To Boulder Dam, Zion Park, North Rim Grand Caynon by Cameron to South Rim, Flagstaff, Aak Creek Canyon to Cottonwood, Arizona, to the mining town of Jerome and to Phoenix. At Tucson we had a nice visit with club members Mr. Davis and Mr. Camp. Then to El Paso, Texas, over the border into Mexico and back across Texas (261 miles in one day) to New Orleans and on to Jacksonville, Florida and home. We covered thirty states, Lake Louise, Canada and Mexico. While in Colorado we drove to the top of Mt. Evans (14,260 ft.) the highest road in America. So the little Olds has been as high and as low as any auto. We are thankful for such a remarkable trip, no accidents, and found everything all right at home. We enjoyed the mountains and the deserts so much, but most of all, the friendship of the many nice people we met, and especially the delightful club members.



ABOVE
MR. AND MRS. GEORGE C. GREEN OF LAMBERTVILLE, NEW JERSEY, IN THE 1904 OLDSMOBILE THEY USE TO COMMUTE BETWEEN LAMBERTVILLE AND LOS ANGELES.

Sincerely yours,

Mr. & Mrs. George C. Green
George C. Green Machine Shop
61 York Street
Lambertville, New Jersey

In the early 1920s, Martin-Parry Corp. was a big U. S. manufacturer of commercial car bodies, for a few years grossed up to $5,000,000 annually. Its founder and president is tall, fretting, blue-eyed Frederick M. Small, son of the town's richest man, who went through Yale, returned to set up his own candy factory, and before he was 22 employed 200 men. Now he is 61, and since 1927 Martin-Parry Corp. has lost money every year. That year Henry Ford changed over from Model T to Model A, and Martin-Parry, with a big stock of T-style bodies and parts, took an inventory loss of at least $1,000,000. Meanwhile other manufacturers took to making their own truck bodies. In 1930 General Motors bought up the Martin-Parry bodyworks for something like $900,000. By 1932 Martin-Parry sales were only $29,141, and on the $29,141 the company managed to lose $184,739.

Tenacious Fred Small paid off some of his debts, continued in business producing drawn steel auto parts (windshield frames, etc.). He worked on a coating for steel sheets to make them appear less cold and metallic. His plant is capable of turning out 180,000 square feet of steel paneling per day, enough for 1,000 small home interiors, but the market for it has not arrived, although the paneling is being put into four Maritime Commission ships and into a new office building in Washington. So the business continued to lose up to $180,000 a year.

But one part of Martin-Parry's business is now going full tilt. Associated with Small in Martin-Parry is A. P. Buquor, who invented and patented for the company a piece of equipment by which the U. S. Army's principal light artillery piece —the 75 mm. (3-inch) gun built on an 1897 French design, formerly pulled by horses —has its old wagon wheels replaced by bump-absorbing, pneumatic-tired wheels, so that it can be motor-drawn at high speeds over rough ground without going to pieces. Martin-Parry's gun-carriage plant is working seven days a week, 24 hours a day. Nearly all U. S. light field guns, some 2,500, are equipped with their adapters. Last year Martin-Parry supplied 400 to the Canadian Army. (The Canadian expeditionary force, now equipping, may order some 250 more.) A few months ago Britain sent in two whopping orders for them, bringing her total to 2,500 units, $1,348,000. Holland also bought Martin-Parry adapters for her 6-inch field guns.

These war orders were already coming in 1938. They upped Martin-Parry's sales for fiscal 1938 (ending Aug. 31) to $326,730 from 1937's $77,567, reduced its deficit from 1937's $183,502 to $58,347. It was about the same for fiscal 1939: sales $371,395, deficit $58,748. Meanwhile the French Army has approved the Martin-Parry gun carriage. If France should equip all her light field guns with them she will require considerably more than Martin-Parry has sold to date.

TIME, December 11, 1939

RUTH MATHEWS, WIFE OF CLUB DIRECTOR TOM MATHEWS, BECOMES "QUEEN FOR A DAY"

RIALTO, CALIFORNIA, FRIDAY, MARCH 21, 1947

Mrs. Matthews Gets Heart's Desire As She Becomes 'Queen For a Day'

In one breathless day to be chosen on the Jack Bailey "Queen For a Day" program, to dine at the Arrowhead Springs Hotel ═══════, to be awarded a moving picture camera, a Servel refrigerator, a complete wardrobe, 50 dollars in cash and a round-trip by air to Sacramento and return was the unique experience of Mrs. Ruth Mathews of 213 So. Date street, Rialto.

To begin with Mrs. Matthews wasn't certain that she wanted to attend the National Orange Show, but she finally went and there the story begins.

With hundreds of others crowded about the stage at the opening of the Jack Bailey "Queen For a Day.... program suddenly the master of ceremonies pointed to Mrs. Matthews out and acked "What do you want most?

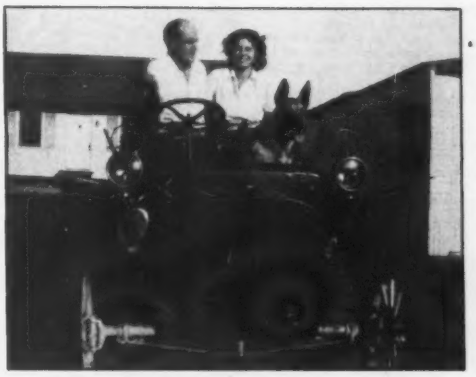
"I'd like a top for my one cylinder 1906 Cadillac." And that is how Mrs. Ruth Matthews became queen for a day, and got the coveted top for the car which is even now being fabricated in the shop of Al Harmon, Plymouth and De Soto dealer in San Bernardino.

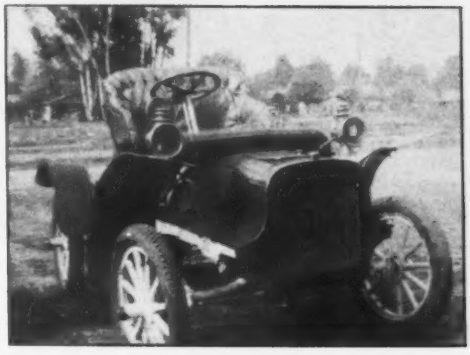
That 1906 one-cylinder Cadillac is only one, in a stable of antique jallopies, for Thomas Matthews and his wife Ruth are members of the Horseless Carriage Ass'n. and for many years have made it a hobby to collect ancient vehicles. And last Friday it was a hobby which began to pay off.

One of the privileges accorded the Queen for a Day is to take along a guest, and Mrs. Matthews elected to take her husband. ═══ ═══ they were flown, on the following day via Western Air Lines to San Francisco. At San Francisco they transferred to United Airlines and were ferried to Sacramento where they were personal guests of Gov. Warren. At Sacramento they were taken on a personally conducted tour of the state capitol buildings which embraced a journey to the very dome of the capitol which had not been open to visitors since before the war. While in Sacramento they visited the Crocker Art Gallery and made a side trip to Sutters Mill and fort, site of the original gold strike which brought the argonauts and forty-niners to California.

At the El Rancho Night Club in Sacramento Mrs. Matthews was invited to tell of her hobby, the collection of antique automobiles, and how her hobby had resulted in the good fortune of becoming Queen For A Day, which she did with enthusiasm. And she is just as thrilled now at the end of 1200 mile journey by air from which she has just returned via Southwestern Airlines as when speaking to a vast audience over KXOA at Sacramento.

The list of gifts which Mrs. Ruth Matthews will be receiving almost completely covers a page of paper in double spaced typewriting, but over none of them is she so excited as the new fabric tourist top for a 1906 one cylinder Cadillac.





VIEWS OF TOM AND RUTH MATHEWS WITH THE 1906 CADILLAC THAT NEEDS A TOP

MRS. RUTH MATTHEWS, Rialto Matron, is crowned by Governor Warren at the Orange Show on Jack Bailey's "Queen For A Day" program Friday, March 14, 1947.

Photo by Randolph Studio, San Bernardino

FOTO FACTS

By John Reynolds

OLD AUTO — After 39 years, they parted.

They had been together continuously since their meeting back in 1908 when he took her home with him.

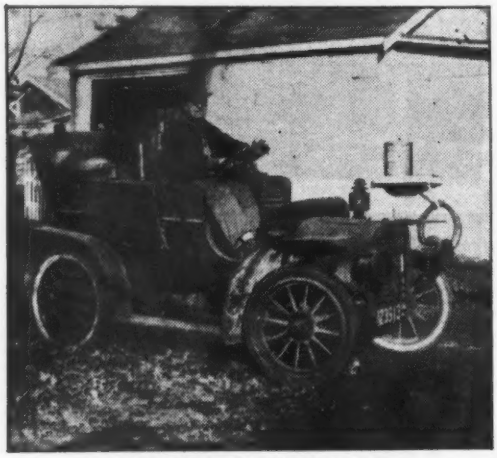
For nine wonderful years they ran together. They were together in the daytime and they were out together at nights.

And then, he found a new love and she was set aside.

She ran her last in 1918, when she was used to help the Zarub family move to its present address on Daniels street, after Zarub had built that house.

And then she was retired and she wasn't licensed again.

In the meantime, Zarub owned a number of other cars. The one which replaced the 1905 Cadillac in his affection was a "Baby Grand" Chevrolet.



L. A. ZARUB & 1905 CADILLAC

. . . it had one 'lung' and a chain drive. . . .

She lost out to the "Baby Grand" of the day and her heart had not really beat since 1918.

He is L. A. Zarub, 1047 Daniels street NE.

And she is a 1905 Cadillac.

She was not a new car when Zarub got her. She had been delivered to the Stepanek and Vondracek hardware store when that firm acquired the Cadillac agency and for a long time she had been a demonstrator.

□ □ □

To the best of Zarub's recollection, he got her in 1908, when she was three years old and after he had sold an earlier make of Cadillac he owned.

But he has never forgotten the happy days with the Cadillac—which in catalogue language was a "Model F Touring car.'

□ □ □

"She paid for herself during the first year I owned her," Zarub remembers. "She'd do 25 miles on a gallon of gasoline and I got $3.50 for hire during the first hour and $2.50 for each succeeding hour. I drove her sometimes for $15 a day—and seldom got off the pavement."

Zarub's use of the car was about like the use which the owner of a private airplane would make of his air vehicle these days. Operating the Cadillac was not a business—it was a pastime with Zarub, and an enjoyable, profitable one.

The longest trip Zarub ever made out of town with the Cadillac was a trip to the Amana colonies, when he took a man there who had come to Cedar Rapids by train but could get no rail connections to the colonies during the entire weekend. The roads to the colonies then were far from what they are now and Zarub didn't even know the way. Neither did his passenger. They got a "guide" and the "guide" got lost too.

□ □ □

Eventually they made it.

As a reward for the trip, the man whom Zarub had driven to the colonies presented him with a fine driving coat. Zarub still has it. Fashioned after the style of the linen duster of early driving days, the coat is much heavier, is water-repellent.

Zarub paid $1,040 for the Cadillac. It came without top and without lights—headlights that is. There were two kerosene lamps on the outside cowling and a kerosene tail lamp.

Zarub added the old carbide lamps—brass mounted jobs which assumed the position of headlights on the car.

Zarub still has the catalogue which came with the car. It points out that the color was "Brewster Green," and adds . . . "With primrose running gear, black hand-buffed leather trimmings."

□ □ □

The car was powered by a one-cylinder motor; had a center chain drive. Weight was listed at 1,350 pounds; length, 9 feet 4 inches.

"Unless otherwise specified," the catalogue said, "the Hartford Perfected Dunlop tires will be furnished as regular equipment. The Cadillac Automobile Company is, however, ready to supply any standard clincher tire."

And speaking of tires, Zarub remembers that they had no treads—just heavy outside casings—smooth to the roadway.

And retreading, as we have experienced it in recent years really is nothing new, Zarub says.

□ □ □

He produces a section from one of his old tires to illustrate his point, when a car owner got a bad tire, he had the exterior casing of another tire sewed onto it. It was the refread of the day.

And now we come to the sad story of the parting.

Zarub has sold the 1905 Cadillac.

It went to Bill Cain and Luther Watson, both of Cedar Rapids.

The two men pulled the old Cadillac away from the Zarub garage about 10 days ago. Before the Cadillac rolled away, Zarub posed with it, and the resulting picture is shown in today's FOTO FACTS column.

AT FORTY MILES AN HOUR

"Fine view, isn't it?"
"Yes. It was."

If we print jokes, people say we are silly.
If we don't, then we're too serious.
If we clip things from other papers,
We are too lazy to write them ourselves.
If we don't, we're stuck on our own stuff.
If we stick to our job all the time, we ought to be hunting news.
If we don't print contributions, we don't appreciate effort.
If we do, the paper's full of junk.
If we make a change in a fellow's writing, we're too critical.
If we don't, we're asleep.
Now probably someone will say
We swiped this from another paper.

"Can I help you?"

* * * * *

ADVICE TO MODEL "T" OWNERS

Don't fall into the error of thinking that the "Timer" should be allowed to run without oil. In the old days many owners made this mistake; they carefully kept it wiped dry and in consequence were always tinkering with the tremblers on the coils and the adjustment of the carburetor, trying to fix that elusive "something" that seemed to be the matter with Lizzie. All she needed was a good shot of oil (not the Castor variety) from the old reliable squirt can. Don't be afraid of overdoing it, the excess will run out. Don't do it while the engine is running, you might get your hand in the fan.

SIGHT SEEING IN CHICAGO

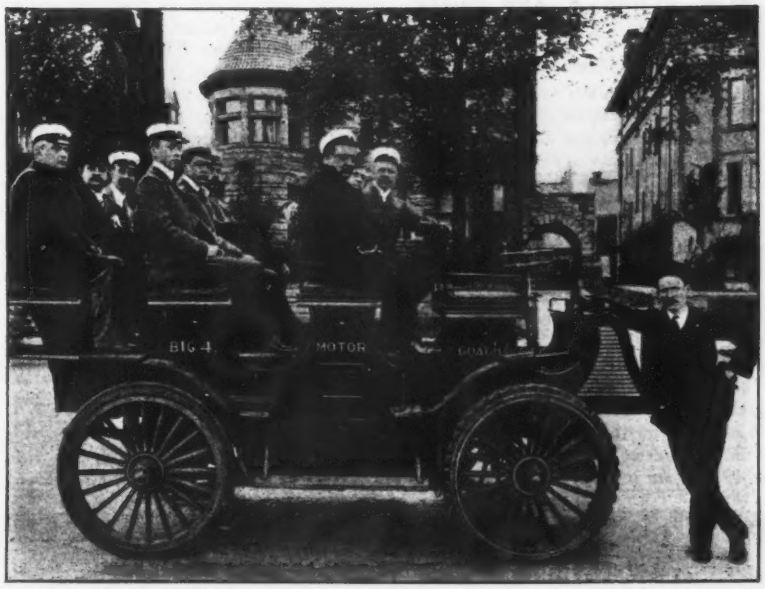
From HORSELESS AGE, August 16, 1905

"The Chicago Automobile Sight Seeing Co. were the first in the field in that city. In the summer of 1900, Messrs. Cirkle and Rohrmeimer, realizing what a splendid opportunity the excellent boulevard system presented for something of this sort, put into operation an electric brake of local manufacture (Woods), seating comfortably ten passengers and operator, with which they made regular trips on the North Side over the Lake Shore drive and through....

(continued in reprint article on following page)

Lincoln Park, charging a fare of $1 per passenger.' They also ran the vehicle on the South Side through the business section, over the boulevards and through Washington and Jackson parks, charging $1.50. This pioneer car proved to be a success, and the following year they put several more cars in operation. At the present time they are operating nine brakes of the same manufacture, two of them being sixteen passenger, three ten passenger, and four four passenger. All are equipped with Exide batteries of forty cells, which cost them about $400 each, and which last for an average of one year. It is necessary to renew the positive plates every four or five months, and the batteries are washed every three months. They operate their own garage and power plant, and state that the recharging of batteries costs an average of $10 a month for each car. The charging is done at night, and a charge of nine hours will carry the car from 35 to 40 miles. At the end of each trip the batteries receive a slight recharging to "liven them up." The tires used on the larger cars are 5 inch solid rubber, and those of the smaller are 3½ inch solid. All of the cars have adjustable tops which can be put on or taken off in a very few minutes. Mr. Rohrheimer states that he does not believe that the large cars, with a seating capacity of from thirty to forty passengers, can be operated advantageously as they are too noisy and too slow, and the hotels as a rule object to having them stand in front of their doors.

Another company operating in Chicago is the American Sight Seeing Car and Coach Company, whose service there is similar to the services operated by it in New York, Boston and Philadelphia. One of the company's cars, a thirty-five passenger Vehicle Equipment Company's make, is illustrated herewith as it passes the Art Gallery on the Lake front. The local manager of the company is W. E. Sebree.



SIGHT SEEING CAR CHARTERED BY SWEDISH SINGING SOCIETY.

The Big Four Motor Coach Company operates four gasoline brakes of the Chicago Motor Vehicle Company's manufacture. These vehicles have double opposed cylinder motors of 20 horse power, a friction change speed gear and double bevel gear transmission to the rear axle. The wheels are of comparatively large diameter and fitted with solid rubber tires. There is also another company operating a number of the same make of vehicles. A good deal of the business of the two companies consists in giving rides to delegates to the numerous conventions that are held in Chicago, and if a larger party than can be handled by one of the companies applies for accommodations, the two join forces. The two companies pride themselves that in their relatively long period of operation they have never had a breakdown.

THE FIRST SIGHT SEEING VEHICLE USED IN CHICAGO—MAYOR DUNNE AND ALDERMANIC COMMITTEE INSPECTING CITY BOULEVARDS.

Hartford.

Hartford, Conn., one of the best automobile cities in the country for its size, has as yet no established auto sight seeing business, which is perhaps explained by its proximity to New York, with its greater variety of attractions. However, as the city has handsomely laid out public parks, good roads and attractive suburban resorts, all easy of access by the horseless carriage, the coming year will likely see a change.

S. A. Miner, who represents the Knox Automobile Company in Hartford, has two touring cars for charter that will hold fifteen passengers each. These vehicles are covered to afford protection to occupants during showers. They have solid rubber tires, the life of which is guaranteed at two years. The cars have 20 horse power, two cylinder air cooled engines, and can be speeded 12 to 18 miles per hour.

After the above was in print we learned that Mr. Miner on August 14 placed on the streets a "sight seeing" automobile, which makes regular trips, leaving City Hall at 10 o'clock and 2 o'clock, one and one-half hours' ride around the city for 50 cents, at 5 minutes after 4 for the golf grounds, fare 25 cents, and at 7:30 for two hours' evening ride for $1.

NEW VEHICLES AND PARTS.

The White Steam Touring Car.

Although the power system in the 1903 White car is fundamentally the same as in the 1902 car, important changes have been made in some details and in the general arrangement of the component parts of the mechanism, and improvements have been added, particularly in the pump system—that vital part of any steam car. There was considerable surprise, and even regret, last winter when it was announced that the White Company had decided to discontinue the manufacture of its runabouts and henceforth confine itself to touring cars. The company correctly estimated the great demand for touring cars which was to characterize this season and decided to build 800 cars of the touring model, 500 of which, we are informed, are already in the hands of customers. In the present article it is proposed to describe particularly the novel features of the touring car, by the aid of a number of half tones and line cuts.

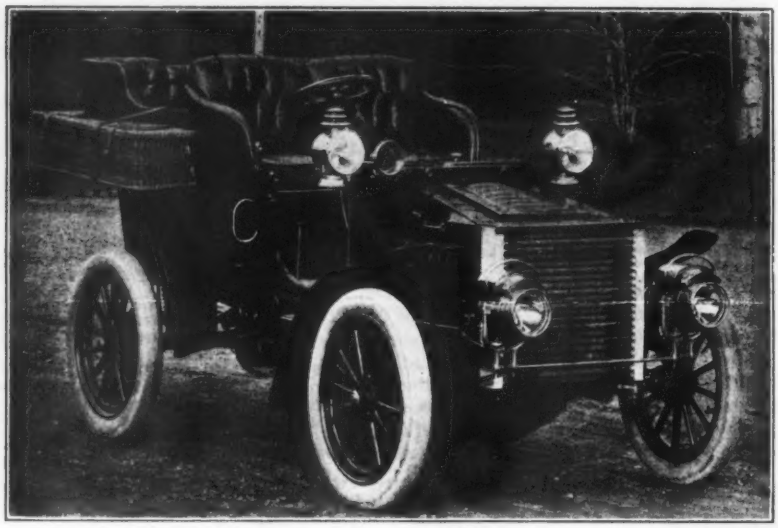


FIG. 1.—THE WHITE TOURING CAR.

THE FRAME.

The frame of the White touring car is of composite construction—hickory wood frame beams with steel flitch plates and channel steel cross braces. The flitch plates lie on the inner side of the longitudinal frame beams and have their ends bent and fastened to the end cross beams to form angle braces. In addition to the end cross beams there are three intermediate cross braces of channel form, two in front and rear of the boiler respectively, and supporting the latter, and one below the dash. The spring horns are hollow castings and are bolted to the wood beams of the frame. The engine and steering gear are supported on longitudinal frame members which fasten to the cross members.

The running gear is reachless and the frame is supported by semi-elliptic springs in front and rear. The wheel base is 80 inches and the tread standard. Thirty inch artillery wheels are used, shod with 4 inch Goodrich clincher tires. As compared with most other steam cars the White has the distinctive feature that all the parts of the mechanism are supported by the running gear frame and are independent of the body.

The front axle is tubular and is constructed with Elliott steering pivots. The rear axle is a live axle and is now enclosed in sleeves which support the casing of the driving gear and differential. The differential, by the way, is of the spur pinion type. All bearings are ball bearings.

THE GENERATING SYSTEM.

The generator, or semi-flash boiler, is essentially the same as formerly, comprising twelve superposed spiral coils, through which the water is forced in a downward direction. It is placed under the front seat of the car and is heavily lagged with asbestos. The burner also retains its characteristic features—circular concentric ridges in the burner plate with radial flame slits through the top of the ridges and air tubes between the ridges. The live steam pipe passes down through the centre of the burner and forward to the throttle valve, which is located at the side of the engine crank case, under the bonnet in front. The thermostatic fuel regulator is placed in the main steam pipe before it passes through the burner.

The gasoline tank is made of a seamless steel shell and has a capacity of 10 gallons. It is placed below the footboard, as shown in the accompanying plan view of the chassis. The water tank is located in front of the dash and holds 15 gallons. The range on one charge of supplies, both gasoline and water, is stated to be 100 miles.

The smoke flues of the boiler extend sideways beneath the seat and end in two slightly flattened, rather inconspicuous discharge tubes running fore and aft beneath the overhanging seats of the body. In the transversely extending flues, or draft pipes, are located automatic wind blinds, to prevent back draft.

THE ENGINE.

The engine is compounded and is located in front under the bonnet, in a vertical position, the two cylinders being arranged in a fore and aft plane. The high pressure cylinder has a bore of 3 inches, the low pressure cylinder a bore of 5 inches, and both a common stroke of 4 inches. The two cylinders and the valve chamber between them are made in a single casting. The latter is provided with a head casting on top, and is bolted with its lower end to an intermediate casting, which in turn is secured to the crank casing. The crank casing is an aluminum casting, and is made in two parts, joined in horizontal plane through the centre of the crank shaft. The object of the intermediate casting is twofold. In the first place, it gives access to the stuffing boxes; besides it removes the crank chamber from the cylinders, and thereby prevents all possibility of steam getting into the crank chamber.

The valves are of the D slide valve type, and operated in the usual manner by means of eccentrics and the Stevenson link motion for reversing the direction of rotation. Provisions have also been made to enable live steam to be admitted to both cylinders, and this is accomplished by means of a novel arrangement comprising three poppet valves and a rock shaft on top of the cylinders.

When it is desired to produce an extra amount of power, as might be necessary, for instance, on very steep grades or in exceedingly difficult places, live steam is admitted to both cylinders and the engine operated as a simple engine. To make the change from compound to simple engine requires essentially three different operations, as follows: (1) The high pressure cylinder exhaust must be cut off from the low pressure cylinder admission; (2) the high pressure cylinder exhaust must be placed in communication with the exhaust pipe, and (3) the low pressure cylinder admission must be placed in communication with the live steam pipe. Each of these operations is performed by means of a separate poppet valve actuated by means of levers on the rock shaft, and it will be seen that to change from compound to simple operation requires the opening of two valves and closing of the third. The rock shaft is normally held in the position corresponding to compound operation by means of a long coil spring anchored to one of the supporting arms of the engine. The valve placing the exhaust of the high pressure cylinder in communication with the valve chest of the low pressure cylinder is then open, while the other two valves are closed. The rock shaft is con-

nected to a foot lever convenient to the operator, by means of a system of links and levers. The change from compound to simple operation is made by simply depressing this foot lever.

The crank shaft is of rather unusual construction. The crank for the low pressure cylinder has only one arm, while the crank for the high pressure cylinder has two arms. The crank arms are provided with balance weights to minimize vibration. Between the two cranks the shaft carries two ball bearings and five eccentrics—four for the valve motion and one for operating the boiler feed and condenser pumps. The rear end of the shaft has a double ball bearing supported in the crank casing and to the end of the shaft projecting from the crank casing is keyed a brake drum forming also part of a universal joint for the transmission shaft.

The crank pin bearings are ball bearings, while the crosshead pin bearings are plain. The crossheads are of cylindrical form and operate in cylindrical guides machined in the upper part of the crank chamber casting. The crosshead pin on the low pressure side is made to extend through a slot in the crosshead guide and operates an air pump when the latter is thrown in engagement with it. The pistons are made very light and have only a single packing ring. The piston rods pass through stuffing boxes in the lower cylinder heads and are screwed into the crossheads.

THE THROTTLE VALVE.

The live steam is led from the bottom coil of the generator through a heavily lagged main steam pipe below the footboard of the car to the throttle valve at the side of the engine. The throttle valve is bolted to the same longitudinal channel steel bar by which the engine is supported, and is operated by a small hand wheel just above the steering hand wheel. An illustration of the throttle, which is of the conical seat register type, is shown in Fig 2. In this sketch A is the live steam pipe from the generator; B the steam connection to the automatic feed water regulator; C the blowoff pipe, and D the steam pipe leading from the throttle to the valve chest of the engine. E is the throttle valve body to which is bolted a combined head and supporting bracket F. The stem G of the valve passes through a stuffing box in the head F and has fastened to it by a set screw the operating arm H. When the system is under pressure and the valve is closed the steam pressure holds it down to its seat, but to keep it in position on the seat when there is no pressure in the system or when the valve is open a spring I is provided and a yoke K secured to a threaded boss on the head F. The yoke permits of adjusting the spring pressure if that should become necessary. The throttle becomes leaky in time, when the connections should be broken, the valve removed and ground in its seat until tight.

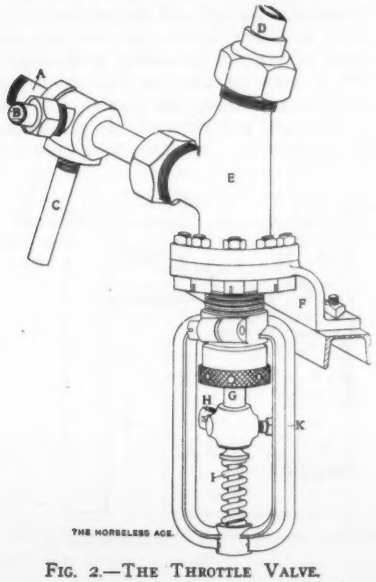


FIG. 2.—THE THROTTLE VALVE.

THE AUTOMATIC WATER REGULATOR.

The water feed on the car is automatically regulated by a diaphragm device. As long as the generator pressure is below the point to which this regulator is adjusted all the water pumped by the feed pump passes into the generator; when the pressure exceeds this point the automatic device opens a valve and the water pumped is bypassed back into the tank. The automatic regulator is shown in section in Fig. 3. A is the connection to the generator; B the copper diaphragm; C the connection to the steam gauge; D the diaphragm pad; F is a push rod screwed into the diaphragm pad D and secured by a lock nut O. The free end of this push rod is provided with flats and passes through the spring block J and rests against the lever arm N. The spring block J can be adjusted by means of the nut I and the worm H. The lever arm N bears against the poppet valve M, which constitute the bypass valve. E E are plugs which, when removed, give access to the mechanism by which the valve is opened.

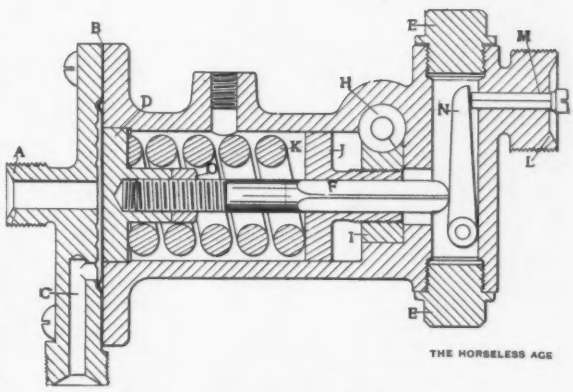


FIG. 3.—AUTOMATIC FEED REGULATOR.

When the steam pressure rises sufficiently to overcome the pressure of the spring K, the pad D is forced back by the diaphragm and the valve M is opened. The water then flows from the pump barrel through the valve M and the spaces left by the flats around the push rod F, out the bypass connection H back to the tank.

The regulator is adjusted to operate between 300 and 325 pounds of steam.

THE PUMPS.

The following pumps are provided on this car: A hand air pump and a hand water pump extending up in front of the seat, centrally; an engine driven feed pump; an engine driven pump for returning condenser water to tank (condenser pump), and an air pump driven off the low pressure crosshead when needed. The engine feed pump and condenser pump are built together and are shown, together with the automatic feed water regulator, in Fig. 4, in their correct relation to the engine crank case, the latter being dotted in.

Referring to this figure, the two pump

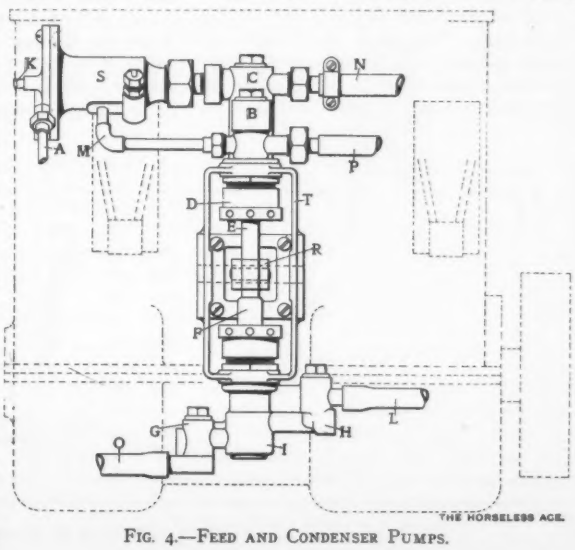


FIG. 4.—FEED AND CONDENSER PUMPS.

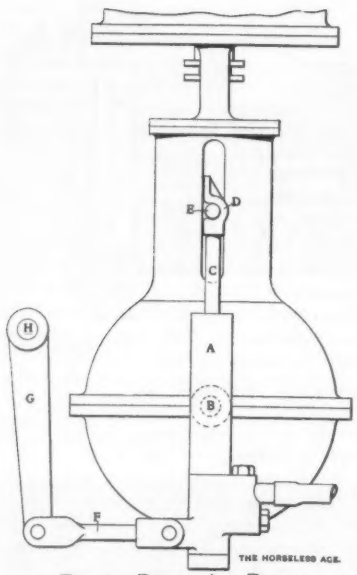


FIG. 5.—POWER AIR PUMP.

barrels are built vertically in line with each other, the feed pump above and the condenser pump below. The feed water arrives from the tank through the pipe or hose P, passes through the suction valve B, pump barrel D, discharge valve C and pipe N to the boiler. That is to say, this is the course the water normally takes when the automatic feed water regulator S is not acting and the bypass is closed. When the boiler pressure rises above the point to which the automatic regulator is set, the latter will open the bypass valve and the water will then be pumped back into the tank through the bypass passage M.

The feed pump plunger E and the condenser pump plunger F are in one piece, although the latter is of larger diameter, and to their middle portion is connected the operating lever R, which is driven by means of an eccentric and eccentric rod off the crank shaft. The water from the condenser arrives through the hose O, flows past the suction valve E and through the pump barrel I, and is then forced past the discharge valve H and through the hose L to the separator.

The supporting frame T of the pumps is bolted to the crank casing of the engine.

The arrangement of the engine operated air pump is shown in Fig. 5. It has been the practice heretofore to have the pump plunger of the air pump, as well as of the feed pump, permanently connected to the crosshead. However, only very little air needs to be pumped, on the whole, except in the rather unlikely case of leakage in the system, and wear of the pump and power can be saved by providing a sort of clutch by which the pump can be thrown in and out of action when desired. In the White touring car the air pump is supported pivotally on the forward end of the crank case, at B, Fig. 5. In this Fig. A is the pump barrel and C the pump plunger, which at its upper end has fastened to it a sort of hook D which will engage with the pin E (extension of the crosshead pin) when the pump is swung around its pivot support. The lower end of the pump is connected by a link F to a lever arm G on a shaft H. The latter runs back parallel with the crank shaft of the engine and is actuated by a foot plunger rising from the footboard. The foot must be kept on the plunger as long as it is desired to continue the pump in operation, when a spring automatically disengages it. The air pressure in the fuel tank is maintained at from 35 to 40 pounds per square inch.

CONDENSING AND SEPARATING SYSTEM.

The exhaust steam from the engine passes direct into the condenser located in front of the car. The condenser is formed of several vertical rows of flanged tubes opening into headers at both sides. The condensed water drops to the bottom of the condenser and is pumped, by means of the condenser pump, into the oil separator, Fig. 6. The latter consists of an upright cylindrical vessel located just in front of the water tank on the left of the car. This separating well contains a screen at the bottom, upon which is placed waste for filtering the water and depriving it of the oil it holds in suspension. The waste requires renewal about every 100 miles. The separating well is provided with a cap, and the joint between the cap and body of the well is packed with a gasket, to prevent waste of water. Some oil will inevitably find its way into the water tank, and it is recommended that when an accumulation of oil is seen on top of the water in the tank the latter should be cleaned.

In Fig. 6 are shown the main water and steam connections, the former in full black lines and the latter shaded. In this figure, A is the boiler; B the high pressure cylinder of the engine; C the low pressure cylinder; D the throttle valve; E the water tank; F the condenser; G the separator well; H the automatic feed regulator; I the feed pump; K the condenser pump, L the hand feed pump and M a hand valve in the feed pipe.

LUBRICATION.

The parts in the crank chamber are lubricated by splash, and oil is fed to the chamber and into the cylinders by means of power pumps located on the dashboard and driven from the main shaft by means of a belt. The cylinder oil pump also contains a hand pump by which the oil may be forced into the cylinder by hand. The rear axle is encased with the compensating gear and runs in oil. A filling opening is provided near the top of the casing, through which oil is added from time to time. The same oil is used for the compensating gear as for the cylinder. Provisions are also made for effectively lubricating all the minor wearing parts. The universal joints of the driving shaft are provided with hollow pins for grease lubrication. The steering joints and spring bolts are also made hollow for grease lubrication, and a compression grease cup is furnished with the tool outfit for lubricating these joints.

THE BEVEL GEAR DRIVE.

The bevel gear drive is of the usual construction, with universal and sliding joints, and driving gear and differential encased together at the centre of the rear axle. The gear reduction to the rear axle is in the ratio of three to one, which gives a speed of 30 miles per hour for an engine speed of 1,000 revolutions per minute.

The car is provided with two independent brake systems. One of the brakes is a dou-

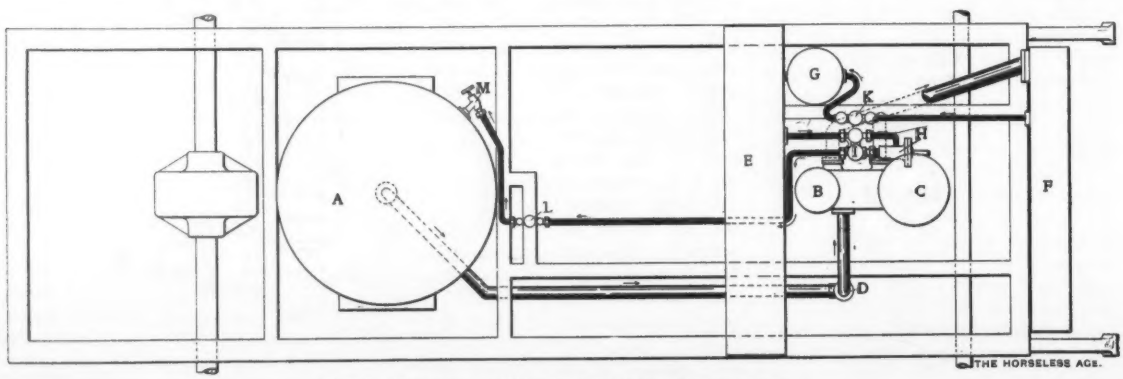


FIG. 6.—DIAGRAM OF WATER AND STEAM CONNECTIONS.

ble acting, external shoe brake and acts on a drum fastened to the engine crank shaft. This brake is operated by a pedal. The other brake is a double rear wheel hub brake and is of the internal expanding ring type; it is operated by means of a hand lever.

The foot brake is very powerful and is the one commonly used for slowing down, while the hand brake is used more particularly for locking the machine in place, as it works on a notched quadrant and can be set.

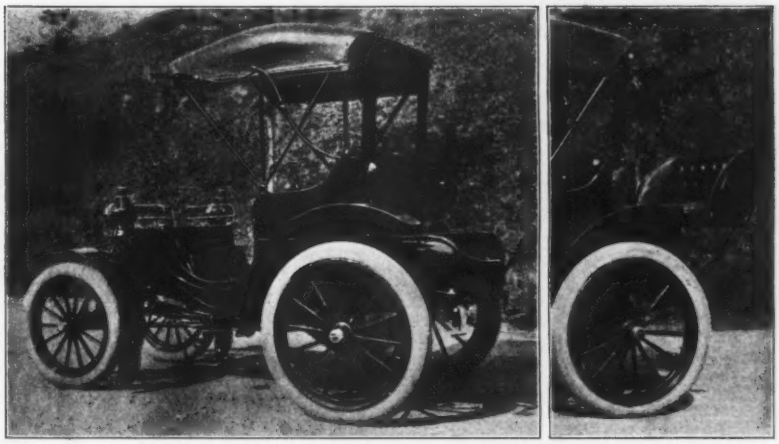
The car is provided with irreversible wheel steering. The body is of aluminum and the tonneau seats are removable. The body is entirely independent of the mechanism, and may therefore be readily removed from the frame with very little trouble. The total weight of the car is 1,650 pounds, and the power equipment is rated at 10 horse power.

The Springer Gasoline Car.

At the shops of John H. Springer, 242 West Forty-first street, New York city, a gasoline machine was recently built after the design of F. T. Clark. The builder proposes to equip his vehicles with either a tonneau, a surrey or a delivery wagon body, using the same design of running gear in all three types.

The motor is located about midway between the axles, the tanks are placed under a hood in front, and the mufflers are secured to the frame at its rear end. The engine has two horizontal opposed cylinders of 4 inches bore and 5 inches stroke, and is rated at 10 horse power. Normally it makes about 900 revolutions per minute. The water jackets extend from the heads to the flanges, instead of only half way between them, as in the majority of automobile motors. Another departure from conventional practice may be found in the circulating pump, which has a plunger to force the water through the system instead of the usual vane. The plunger is actuated by an eccentric, as in launch motors.

Ignition is by means of the secondary system and a belt driven dynamo. No batteries are provided, as the maker does not advocate their use. The variable speed gear is of the planetary pattern and gives two forward speeds and a reverse. The forward speeds are controlled by a single lever. To reverse the car the operator must exert pressure on the pedal provided for this purpose. The motor is controlled by the spark timing lever exclusively, and no means for adjusting the carburetors are provided. A chain drives the differential, which is mounted on two shafts that drive the rear wheels by means of side chains, thus making three chains in all. The shafts that project from the drum of the balance gear are hung from the frame by means of links. Distance rods are employed to take up the slack in the side chains. The rear axle is not moved backward when the radius rods are extended, but the sprocket shafts are swung forward.



DURYEA WITH REAR FOLDING SEAT.

The wheel base of the machine is 78 inches and the tread is standard. The road wheels, of the artillery pattern, are shod with 30x3 inch detachable pneumatics. Both axles are solid steel forgings, and the running gear is reachless. Full elliptic springs are used both in front and in the rear. The frame is of angle steel and has a number of crosspieces of the same stock.

Steering is done by means of a wheel, and a worm and sector gear is fitted to reduce motion. The mufflers are of peculiar construction. Each cylinder has two mufflers, so that there are four in all. The gases escaping from a cylinder pass through two mufflers before they escape into the atmosphere. The water tank holds 12 gallons and the gasoline tank has a capacity of 5 gallons. The radiator has no header castings and comprises a tube bent so as to form eleven rows and the usual radiating disks.

Mr. Springer proposes to build a runabout with a double cylinder air cooled motor. A patent was recently granted the inventor on the construction of the radiating members that will be used in connection with this system.

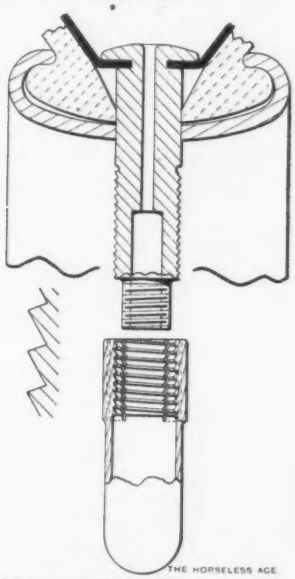
The New Michelin Valve Cap.

To facilitate replacing of the valve cap MM. Michelin, the well known French tire makers, have designed the valve cap shown herewith. The cap is split so that three tongues are formed. Two of the saw cuts are indicated in the drawing, which shows the upper part of the valve cap in section. The threads on the stem of the valve body and inside of the cap are cut as shown so that the cap may be pushed over the valve body. A ring—not shown in the drawing—is slipped over the cap, as soon as it has been thrust into place, to prevent the tongues from spreading.

The cap is removed by sliding the ring off and unscrewing. The ring has no tendency to come off on the road, because the tongues tend to spring out and thus bind it securely.

Duryea Car With Rear Folding Seat.

The Duryea Company have brought out a new design of body, as shown in the accompanying illustration. The design is called a folding rear phaeton. When the rear seat is closed, as shown in the left hand view, the car presents the same appearance as the ordinary phaeton of the company, but when the seat is opened, as shown on the right, a surrey seat is provided, which is claimed to be both comfortable and roomy. The rear seat may be removed, with its framing, leaving a trunk platform for touring purposes. The car weighs 1,100 pounds.



MICHELIN VALVE BODY AND CAP.

During the discussion on the new English motor bill in the House of Lords on July 17 an attempt was made by Lord Camperdown to fix the maximum speed at 20 miles an hour. Lord Herries and Lord Kelvin supported the proposal.

THE EARLY • WHI STEAM

THREE SUNDAY RIDE ENTHUSIASTS WITH THEIR FAMILY DOG, READY FOR A SPIN IN A WHITE STEAM CAR OF ABOUT 1907.

ALL READY FOR A PICNIC. NOTE THE PICNIC BASKET WHICH WAS PART OF THE EQUIPMENT WHICH CAME WITH THIS MODEL WHITE. ALSO NOTE THE SOUTHERN CALIFORNIA BACKGROUND OF CACTUS AND PALMS.

AN EARLY WHITE RACING CAR ALL SET TO BURN UP THE TRACK AT A FAST PACE.

THIS PROUD OWNER PREPARES TO GIVE HIS WHITE STEAMER, CIRCA 1904, A POLISH JOB.

THESE EARLY WHITE STEAMERS WERE QUITE A CAR FOR HILLS. THIS ONE HISSES UP A STEEP GRADE, EFFORTLESSLY OVERTAKING ALL OF THE GASOLINE CARS.

NOTICE THE SCREEN VENT ON THE SIDE OF HOOD ON THIS OLD WHITE. THEY RETAINED THIS FEATURE EVEN ON THE LATE MODEL WHITE TRUCKS AND BUSSES.

AT THE WHEEL OF THIS WHITE, ABOUT 1908,S CAPT. HARMON D. RYUS, DEALER FOR THE WH STEAMER, POPE TOLEDO, POPE HARTFORD, D POPE TRIBUNE IN LOS ANGELES. THEY ARE FRONT OF THE AGENCY, AT 712 SO. BROA WHICH IS PRESENT SITE OF THE PIG'N'WHI RESTAURANT. F. C. FENNER, OWNER OF THE IS SEATED BESIDE CAPT. RYUS. BULLOCK'S A FEW DOORS NORTH, AS IS JEVNE'S, ONCE OF LOS ANGELES' LEADING GROCERY COMPA THE CALIFORNIA FURNITURE COMPANY, UN THEATER, AND THE LANKERSHIM HOTEL.

A MINOR REPAIR HAVING BEEN MADE, THIS WHITE IS ALL RARIN' TO GO.

LOOK—NO HEADLIGHTS! IF THE GENTLEMAN WHO OWNS THIS WHITE IS STILL ALIVE, STILL DRIVING THE SAME WHITE, AND IS STILL NEEDING TWO HEADLIGHTS, HIS BEST BET IS MANNY, MOE, & JACK, OR ART TWOHY.

CAPT. HARMON D. RYUS AND A WHITE OF ABOUT 1907. THE VICTORIA TOP WAS THE LAST WORD IN ELEGANCE WHEN THIS PICTURE WAS TAKEN.

CAPT. RYUS AND F. C. FENNER SEATED AT THE ENTRANCE TO THE WHITE AGENCY. ABOVE THE AGENCY IS AN OLD BUNGALOW WHICH WAS IN THE SAME SPOT AS THE WHITE DEALER'S BUILDING. WHEN THE LOWER STRUCTURE WAS BUILT, IT WAS A LIVERY STABLE AND THE OLD BUNGALOW HAD TO BE RAISED TO THE POSITION SHOWN. WHEN THE WHITE DEALERSHIP TOOK OVER, THE LIVERY STABLE WAS CLEARED OF SEVERAL CARLOADS OF MANURE TO MAKE ROOM FOR THE NEW CARS: THE WHITE STEAMER, POPE HARTFORD, POPE TRIBUNE, AND THE POPE TOLEDO.

WHEW!! TALK ABOUT OVERCROWDED TRANSPORTATION FACILITIES NOW, AND THEN LOOK AT WHAT 1904 WAS LIKE! YES, MR. RIPLEY, THERE IS A WHITE BURIED BENEATH THAT PILE OF GIRLS. LOOK CLOSELY—ONE OF THEM MAY BE YOUR OWN GRANDMOTHER.

New Vehicles and Parts

The Adams-Farwell Motor Car.

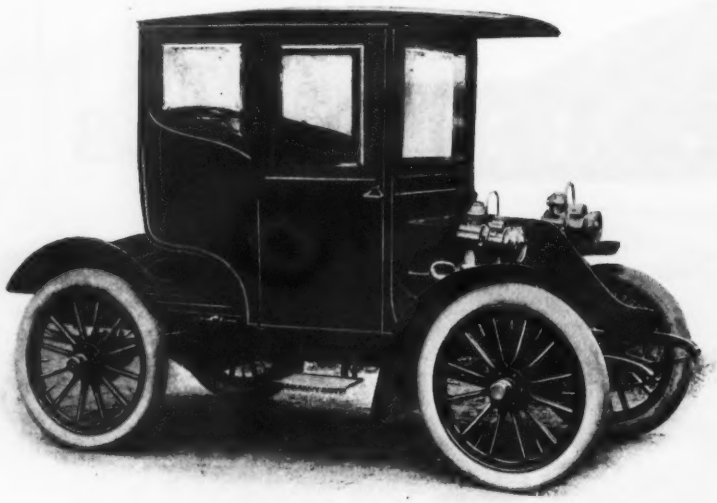
The Adams Co., of Dubuque, Ia., have been experimenting quietly with automobiles since 1898, and are now placing on the market a car which abounds in original features in both the propelling mechanism and the arrangement of the body and the controlling means. It is significant that although the motor differs radically from present standard designs, the general type (triple, air-cooled, revolving cylinder) has been employed throughout from the first, and has, therefore, six years of service to attest its practicability. The Adams Co. have sent us illustrations of all the cars they have built in succession, and a brief review of the development of their car may be acceptable to the reader.

The first motor had three 4 x4 inch cylinders and was placed on a fore-carriage under an express wagon. This model had iron tires and was rather primitive in general appearance. It was operated for several months and proved the practicability of the air-cooling system, of the ignition and several other features. The next model built was fitted with a 5 x4 inch engine of the same type. Its running gear was of the familiar steam carriage pattern. While the engine is said to have proven entirely satisfactory, the running gear proved too light for the high power and the rough and hilly roads in the vicinity of Dubuque.

The third model built had a 5 x 4½ inch triple cylinder engine, which is exactly the same as that now used. The features of this car, which has been operated continually since the fall of 1901, are a reachless running gear, wood artillery wheels, and a tasteful runabout body with large folding seat front compartment. In the fall of 1903 this car was fitted with a canopy top, side curtains and glass front, and it was thus used during the following winter. The canopy top was not entirely satisfactory, however, and for this reason the car was later fitted with a closed body with side doors and large plate-glass front in a substantial frame, sliding in rigid pillars which support a solid roof. The car is a convertible brougham, having a collapsible front seat and being arranged so it can be driven from inside the cab or from the front. The car now to be placed upon the market is known as Model 5, the intervening Model 4 being a car closely resembling Model 3, and sold to a party in Dubuque.

THE MOTOR.

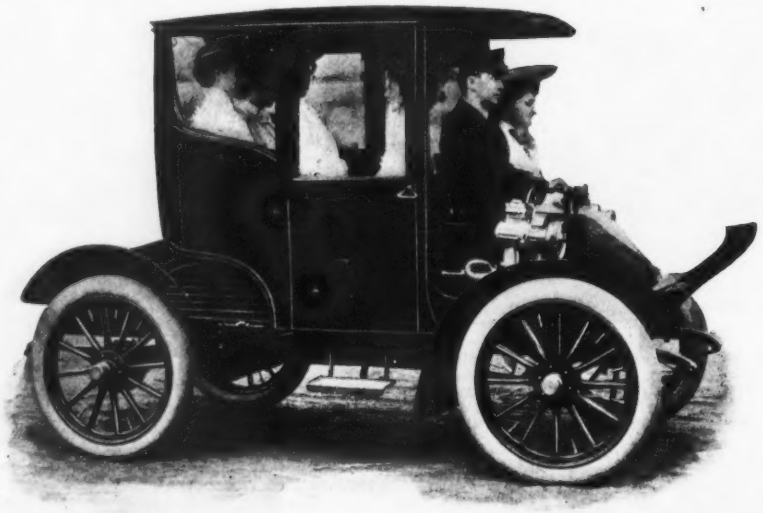
The Adams-Farwell revolving cylinder, air-cooled gasoline motor is claimed to have distinctive advantages because of its compactness, its perfect balance, light weight, wide range of speed and power, and practical air cooling under all conditions. It reverses the ordinary practice in that the engine cylinders revolve and the crank shaft is stationary, instead of the crank shaft revolving and the cylinders being stationary. It is not what is usually termed a rotary engine. Three units, each being a complete cylinder with cylinder head and one-third of a central crank case cast in one piece, are bolted together and bolted to a top and bottom cast steel flange which has bronze bushings forming bearings around the vertical stationary crank shaft. This forms the revolving unit, and is, of course, balanced perfectly. This revolving unit in a 20-h. p. engine with 5″ bore and 4⅛″ stroke, weighs 190 lbs. and forms the flywheel.



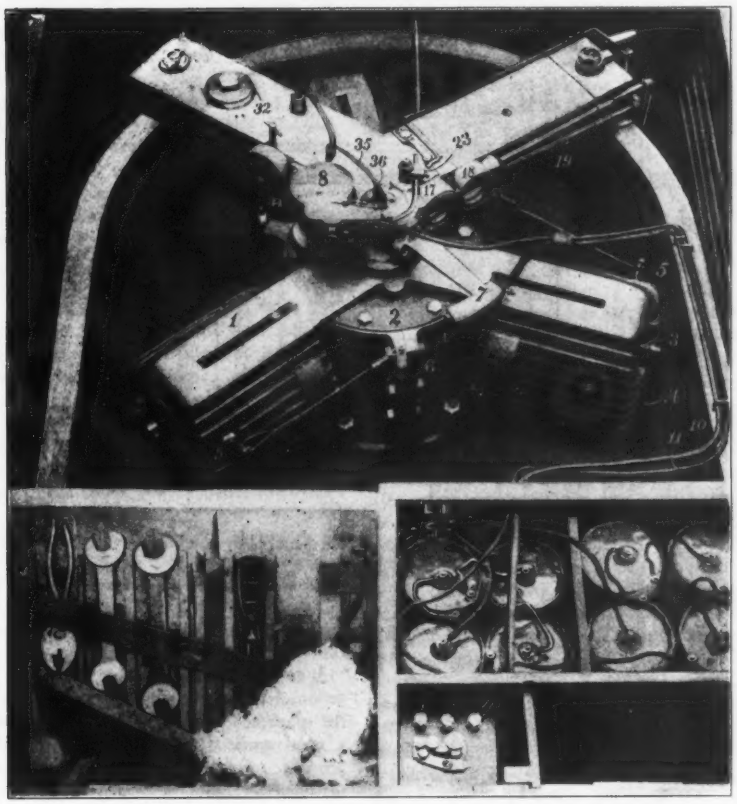
ADAMS-FARWELL MOTOR BROUGHAM.

In each cylinder is a cast piston having four rings. The three pistons are connected to a single crank wrist pin of very large proportions, by bronze pitmans. The pitmans, with the pistons at their outer end, swing around the stationary wrist pin in practically perfect mechanical balance. The wrist pin being eccentric with the axis of the revolving cylinder unit, the pistons are caused to reciprocate back and forth in the cylinder at each revolution of the revolving unit, although the motion of the mass on the pistons does not change or stop and reverse at each dead center, as with the ordinary engine. It is, therefore, susceptible to a very perfect mechanical balance.

All engines exert a force or torque in two directions during the explosive or power stroke. A force or torque tends to turn the crank, and with it the flywheel, over in one direction, and an equal force or torque tends to turn the engine cylinders, casing, etc., in the opposite direction. The ordinary engine has the cylinders and case secured to a foundation, and they cannot turn, but the crank shaft is free to turn. The Adams-Farwell has the crank shaft secured so it cannot turn, but the cylinders are free to turn. The ordinary engines transmit their power from the crank shaft; the Adams-



SHOWING SEATING CAPACITY.



VIEW OF ENGINE AND ACCESSORIES.

1, Inlet passage; 2, head plate of crank case; 3, inlet valve; 4, exhaust valve; 55, spark plugs; 6, insulated high-tension commutator terminal connected to plug by wire; 7, high-tension commutator; 8, circuit breaker; 10, conductor carrying high-tension current from coil to commutator; 11, conductor connecting coil and circuit breaker; 17, gasoline spraying chamber; 18 constant level compartment; 19, gasoline feed pipe; 23, gasoline adjusting valve; 32, oil reservoir filling cup; 34, oil pump; 35, cylinder oil tube; 36, crank oil tube.

Farwell transmits power by bevel gear from the revolving crank case. This is the difference technically, but the builders claim distinctive advantages for this motor where lack of vibration, light weight, simplicity, practical air cooling under all conditions, wide range of speed and accessibility to all parts is a desideratum.

The lack of vibration of the motor is attributed to the perfect balance of the revolving parts, the manner of revolving the cylinders in a horizontal plane around a vertical axis, and to the novel manner of controlling the speed of the motor by their variable compression system.

The light weight of the motor as compared with the three-cylinder motor of the ordinary type having the same power and cylinder sizes, is due to the elimination of many parts found necessary in the engines of the ordinary type: a single central crank case answers for the three cylinders. A single throw crank is employed, of about one-third the weight of the three-throw crank found in the other type of engines. A single valve operating cam opens both the inlet and exhaust valves. As the entire engine revolves, except the crank shaft and base, the engine is its own flywheel, and being heavy (190 lbs.) insures very steady running.

ARRANGEMENT OF EXHAUST.

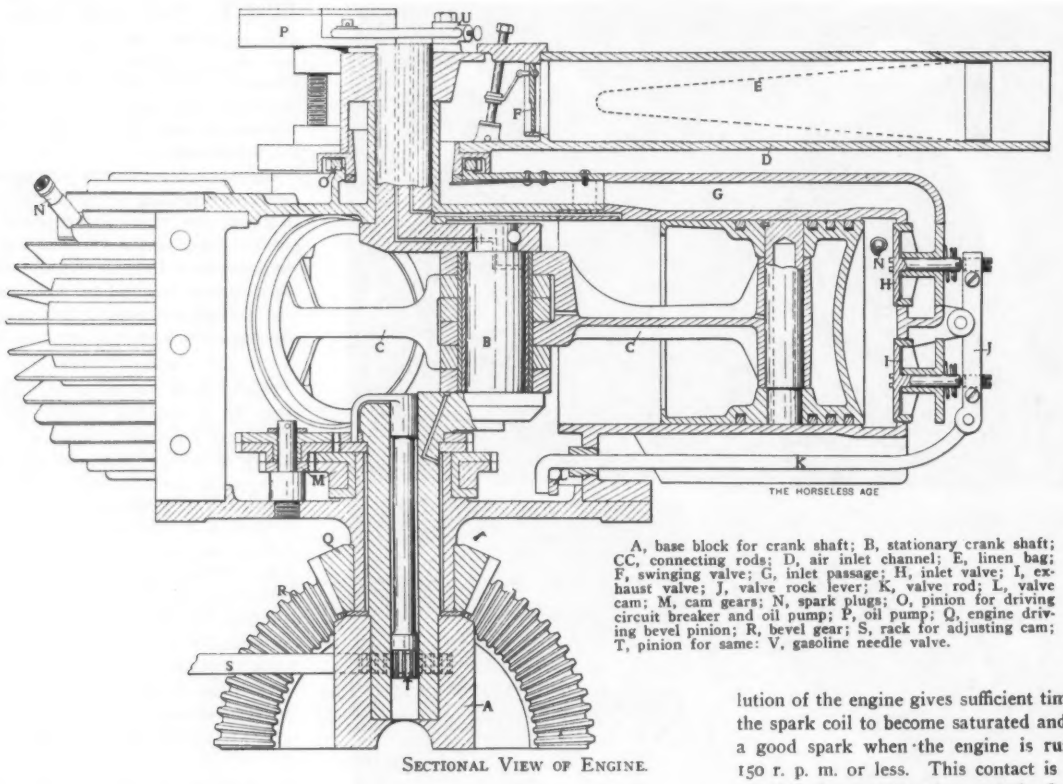
No muffler is employed. It is claimed that because of the velocity of the cylinders passing through the air, a muffler of the ordinary type may be entirely dispensed with. Auxiliary exhaust ports, which let out the high terminal pressure against the rapidly receding volume of air are used. The discharge acts upon the air like a skyrocket, and not like a gun. There is claimed to be less noise with this system than with the ordinary engine when working at full power, and the exhaust cannot be heard when the engine is working at part power. The auxilliary exhaust ports reduce the pressure to that of the atmosphere before the exhaust valve in the head of the cylinder opens. The gases that pass out of the exhaust valve are therefore comparatively cool, and the annoyance of pitted and warped exhaust valves is said to be entirely overcome. The duty required of the valve operating levers, cams and gears is very light, as there is no terminal pressure in the cylinders when the valve opens. The valves are closed by centrifugal force, which varies in proportion to the requirements. The higher the speed of the engine the greater the force, and the greater the need of a stiff spring or force to close the valve. The springs used are made of light piano wire, and are useful only to close the valves in starting the engine, where the centrifugal force at the slow starting speed might not be sufficient to overcome the resistance of cold lubricating oil on the valve stems. After the engine is slightly warmed, the spring might be entirely removed.

The natural cooling is facilitated by the cylinders revolving at a rapid rate, drawing in air at the center and expelling it with great rapidity at the periphery or ends of the cylinder. The cylinders are provided with integral longitudinal ribs, which provide a large radiating surface. The cylinders themselves act as a fan, in a way.

MOTOR CONTROL.

The speed of the motor is controlled entirely by a variable compression system. Means are provided to allow a part of the charge to escape back through the inlet valve, which is mechanically held open for a part of the compression stroke, that part of the charge so escaping being drawn in by another cylinder. There is no waste of gases. When the maximum power is required, the inlet valve is closed at the end of the suction stroke, and the full charge is compressed to about 95 lbs. per square inch. When minimum power is wanted, the inlet valve is not closed until the completion of the compression stroke; an exceedingly small part of the charge is retained and ignited at atmospheric pressure, giving a gentle expansion. A range of power and speed anywhere from maximum to minimum, or *vice versa*, can be had instantly or gradually, as desired. This system of control is claimed to be very economical, to be conducive to very smooth running, to obviate the necessity of heavy exhaust valve springs, to cause the engine to run much cooler and to keep the cylinder heads and spark plugs entirely free from sooty deposits.

The carburetor is claimed to be automatic at all speeds. Gasoline is pumped through the upper pipe 19 (Fig. —) into the constant level reservoir 18, which is a small cavity covered with a watch crystal, enabling the gasoline to be seen, and water (if present) detected. The surplus gasoline flows back into the pump well through the lower tube. An opening connecting the reservoir with the valve 23 is regulated by a needle valve. The air, after passing through a linen bag in the inlet passage, which prevents dust entering, raises the little swing valve and at the same time the gasoline valve 23, forming a vapor which enters the central chamber and thence passes out through the channel at the top of the cylinder and through the inlet valve 3. The sectional view of the engine shows this clearly. The proportion of air and gasoline is claimed to be always the same and the quality of the mixture is constant, but the quantity varies according to the power required and the position of the variable compression cam. The mixing valves are opened only after the sucking cylinder has drawn in that part of the charge which the compressing cylinder is blowing back by its inlet valve.

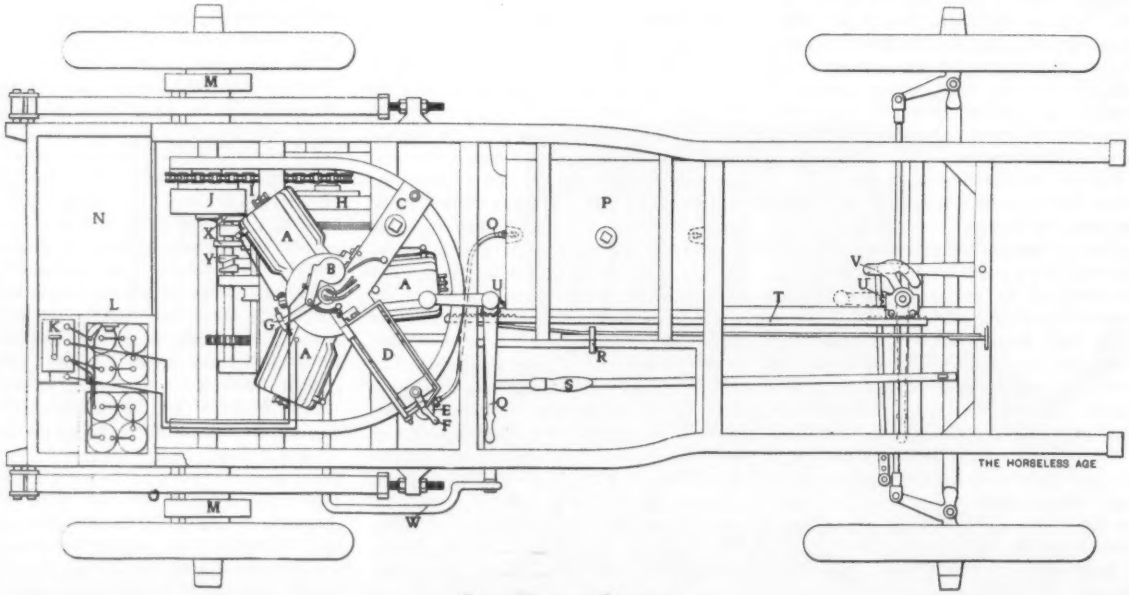


A, base block for crank shaft; B, stationary crank shaft; CC, connecting rods; D, air inlet channel; E, linen bag; F, swinging valve; G, inlet passage; H, inlet valve; I, exhaust valve; J, valve rock lever; K, valve rod; L, valve cam; M, cam gears; N, spark plugs; O, pinion for driving circuit breaker and oil pump; P, oil pump; Q, engine driving bevel pinion; R, bevel gear; S, rack for adjusting cam; T, pinion for same: V, gasoline needle valve.

SECTIONAL VIEW OF ENGINE.

AUTOMATIC SPARK REGULATION.

The spark is regulated by an automatic spark regulator which fires the charge at all speeds at a point to produce the greatest efficiency. This device employs a centrifugal governor which not only advances the spark when the speed of the engine increases, but also increases the length of the contact of the primary circuit. A contact of the primary circuit for 1-36th of a revolution of the engine gives sufficient time for the spark coil to become saturated and give a good spark when the engine is running 150 r. p. m. or less. This contact is automatically increased to about 1-12th of a revolution of the engine when running at 900 r. p. m. This is claimed to result in a great saving of battery current and contact breaker points, for without this variable contact it is necessary to make the contact



PLAN VIEW OF CHASSIS.

AAA, engine cylinders; B, automatic oil pump: C, oil tank; D, air suction channel; E, gasoline well and pump; F, pump lever; G, high-tension commutator; H, change gear; I, driving chain; J, differential gear; K, spark coil; L, sparking battery; MM, hub brake drums; N, tool box; O, gasoline pipe from tank to well; P, gasoline tank; Q, steering lever; R, emergency brake pedal; S, engine treadle; T, rack for operating steering gear; UU, gear sectors connected by rack; V, cam in steering gear.

of the primary circuit long enough for the highest speed, thereby using two or three times as much current when the engine is running slow.

Only one spark coil is used. The high-tension current is carried by wire 10 (Fig. 3) to the commutator 7, consisting of an insulated segment with a brass strip on the lower edge. On each cylinder there is a 6 is an adjustable brass cap which is adjusted to pass under the commutator strip 7 without quite touching. In operation, as the cylinder that is at the time compressing wire leading from an insulator 6 to the spark plug 5. On the top of the insulator approaches the position straight back (which is the dead center position), the insulator 6 is passing under the commutator, the contact breaker breaks the primary circuit, and a spark jumps the gap between the commutator 7 and the cap on the porcelain 6, and thence to the spark plug and into the cylinder.

When the motor is started, the spark is late and jumps the gap at the extreme right hand end of the commutator; a back kick is impossible. As the speed of the engine increases, the automatic spark regulator advances the spark and it jumps the gap further and further toward the left end of the commutator. The exact position of the spark can be seen while the motor is in motion. Two sets of batteries are provided, a spark coil and a double-throw switch which enables either set of batteries to be used separately or both together after they have become too far exhausted to run the engine separately. All the electrical wire is exposed to view and a loose connection can at once be located.

LUBRICATION SYSTEM.

The oiling of all parts of the motor proper is cared for by an automatic, positive feed oil pump. It consists of a circular barrel containing four cam-actuated plungers. The barrel is positively driven by a worm gear, and is claimed to positively deliver one drop of oil to each of the four tubes every 100 revolutions of the engine. Two of these tubes lead to a distributing channel in the upper end of the crank shaft and oil the top of each cylinder; one tube leads to the upper end of the wrist pin and from there to the lower crank shaft bearing; a surplus accumulating in the crank case lubricates the valve operating cams and gears. An opening on each side of each cylinder admits oil from the crank case to the cylinders, thus oiling each cylinder and piston at three equi-distant points. The fourth tube is an extra and is usually turned to deliver its oil back into the tank. The oil tank is located in the left end of the angular aluminum casting which forms a support to the upper end of the crank shaft. Being very close to the engine, it is kept warm in the winter time, and the tubes leading from the pump are very short and not liable to be broken.

ACCESSIBILITY.

Easy accessibility to all parts of the motor, transmission and running gear mechanism is claimed for this car. The entire motor mechanism is under and back of the rear seat. The gasoline tank and a convenient receptacle for carrying tire pump, extra inner tubes, jack, etc., are under the floor between the seats. There is a space under the front seat (some 5 cubic feet) for storing away touring baggage, picnic baskets, etc.

All of the parts shown are accessible, without removing the body. A small trap-door under the front seat gives access to the forward steering-gear mechanism; the floor between the seats is easily removable, as well as the rear seat. For ordinary attention and adjustment, however, the raising of the sloping top of the body is all that is necessary. Every part of the motor proper that will ordinarily ever require examination or adjustment is exposed to view and readily accessible from this position; also every tool required in these adjustments, each in a separate pocket. A few extras, such as spark plugs, valves, bolts, nuts, springs, etc., an extra supply of lubricating oil, an oil can, some waste and a pair of asbestos tanned gloves will find room here.

With no compression, the cylinders may be easily turned around, bringing any one in convenient position for removing spark plug or valve. All valves are duplicate. A cage, forming the valve seat and guide for the valve stem, is screwed into the head of the cylinders. Should a valve leak, it can be replaced by another in a few minutes on the road, and the grinding-in process done at leisure.

No gaskets or packed joints are used on the engine, and the brass gasoline pipe, some 4 feet in all, is the only pipe about the engine. By taking out three bolts on each side, two on the top and two in the bottom flange, any cylinder may be removed for examination of piston, pitman or interior of crank case without disturbing any other part of the engine. By removing the two cap boxes on the transmission shaft, the entire mechanism can be removed.

The base of the motor to which the crank shaft is keyed is a spider-shaped bronze casting, which is secured to the châssis of the car by five studs. Every part of the motor and transmission is secured to this bronze casting, forming an integral, rigid power unit that may be removed and operated independently of any other part of the car.

The complete power plant, including all parts of the motor, transmission, oil tank and pump, carburetor, clutch operating cams, etc., forming an integral power unit secured to the bronze supporting spider, weighs 387 lbs. Of this, 157 lbs. is made up by the transmission which would not be needed if the motor was used for other purposes than that of automobile propulsion. Of the 230 lbs., the weight of the motor proper, 190 lbs., is the cylinders, etc., forming the revolving unit or flywheel. All motor and transmission bearings are bronze with steel shafts, and the bearings are renewable.

The gasoline tank is made of heavy copper, riveted and soldered. It has a partition in the center with a communicating stop cock. With stop cock open, both halves of the tank will be filled; if then shut off, warning will be given when half of the gasoline has been used and there is just enough gasoline left to get home on. A union stop cock is in either end; the tank is slung under the center of the car by two heavy straps and may be easily reversed should an accident cause one end to leak, or it may be removed if it is desired to store a car in a building where gasoline would not be allowed; it obviates the necessity of looking for clean cans in which to draw off gasoline.

CONTROL.

The Adams-Farwell car may be operated from the rear seat of the inclosed compartment, or from the folding front seat. This system is patented, and is considered a valuable feature in a car of this character, as the operator should at all times have an unobstructed view of the road. The change of the controlling column and pedal from one seat to the other is said to be less than a minute's time.

In the controlling of the car there is employed a steering lever, one clutch lever (which also locks the brake), one treadle to vary the speed of the engine, and a pedal to apply the hub brake—four devices in all. The clutch lever when in position straight back, locks the hub brake; a movement forward to the right releases the brake and engages the low forward gear; further movement releases the low and engages the high gear, while a backward movement first releases the high and engages the low gear, then releases the low and engages the backing gear, which may also be used as a brake. There is a position between the brake and backing where the spark is shut off and the engine stopped.

The speed of the motor is controlled entirely by a foot treadle, which controls the variable compression system. Spark and carburetor are governed automatically. The position of the foot is natural and will not cause fatigue. A pressure on the toe increases the speed of the engine, a pressure on the heel decreases the speed.

BRAKE.

An internal, expanding, double-acting brake on the rear hub is engaged by pushing a pedal forward. If this brake is engaged when the clutch lever is straight back, the brake will be locked. In this position the car will be securely held on a hill or elsewhere. As soon as the clutch lever is moved to engage either the backing or low forward gear, the brake is automatically released. No harm will therefore result if the oper-

VARIABLE STRENGTH SPRING.

ator should forget to release the brake before engaging the clutch.

STEERING GEAR.

The steering gear adopted is claimed to combine the quick action of lever steering and the safety of wheel steering. A cam movement is interposed between the steering knuckle and the hand lever, that is practically irreversible, and relieves the hand of shocks caused by the wheels striking an obstruction. The control column to which the steering lever is hinged forms a rigid hold for the left hand, giving the operator great leverage, and at the same time the left hand is in position to instantly release the clutch or change gear, while with the right hand a quick turn may be made. The controlling levers and pedals do not interfere with entrance or exit from either door or side.

SPRING SUSPENSION.

It is impossible to construct a car with the ordinary springs and have it ride equally comfortably and safely with a passenger load of 150 lbs. and with a load of 900 lbs. If the springs are strong enough for the heavy load, they are too stiff for the light load, consequenly uncomfortable riding.

The Adams-Farwell car is therefore equipped with patent variable strength springs. These consist of springs with an auxilliary leaf and means for clamping this leaf to the main spring. When more than two occupy the compartment, the rear auxilliary springs are clamped to the main springs. When the front seat is occupied the front spring is clamped. The operation of loosening or clamping these auxilliary springs is said to require but a moment's time. Both front and rear springs being the same length and width, 40in. x 2in., one extra spring carried on a tour would replace any spring should one be broken by accident.

RUNNING GEAR.

The car has an angle steel frame, which is supported on semi-elliptic springs 40in. in length and 2in. in width, the front springs having six leaves and the rear springs seven leaves. The front axle is a 1⅜-in. square, solid steel axle, and the rear axle a 2-in. heavy-walled tube. The axle bearings are of the Timken roller type. The rear axle is a live axle, carrying a spur gear differential just inside the left hand spring. It is driven through a 1½in. x ¾in. detachable roller chain. The wheels are of the wood artillery type, 34in. in diameter and shod with 4in. double-tube tires. The car has a wheel base of 84in. and a tread of 56½in. The body is of the brougham type with two seats inside and a folding seat in front outside. The passenger capacity is seven—three on the main seat, two on the intermediate seat inside and two on the front seat outside. The car is finished in black with gold stripe. It can be operated either from the front seat or from inside the closed body.

Attention is called to the secure manner of fastening the body to the châssis, six half-inch bolts being used, passing through metal-bushed holes in the body so as to avoid shaking loose. The châssis can be operated with the body removed, and a temporary seat may be provided if it is desired to run the car in a "stripped" condition in contests. The under part of the car is entirely free from delicate mechanism which would be injured by running over brush, weeds, etc. The clearance under the center of the car is 14in.; the differential and chain being on one side, come over the path made by horses and are 11½in. from the ground.

All the novel features, such as revolving the cylinders around a vertical, stationary crank shaft, system of muffling, variable compression control, automatic spark regulator, control from front and rear seat, variable strength springs, carburetter, oiling system, etc., are the subjects of patents granted and pending in this and foreign countries.

Brennan Four Cylinder Engine.

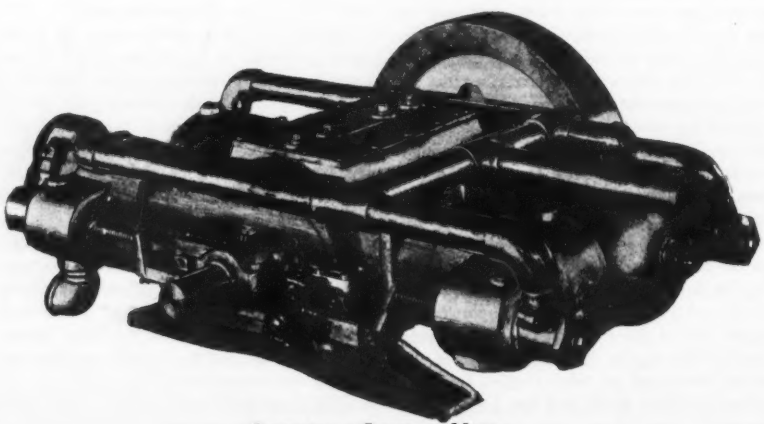
The Brennan Motor Car Co., of Syracuse, N. Y., have recently added to their line of gasoline motors a four-cylinder horizontal opposed type which is made in three sizes as follows: A 28-h. p. motor of 4¾ inches bore by 5 inches stroke, weighing 400 lbs. and running at 800 r. p. m. normal speed; a 32-h. p. motor of 5 inches bore and stroke, weighing 425 lbs. and running at 800 r. p. m. normal speed, and a 40-h. p. motor of 5½ inches bore and 6 inches stroke, weighing 550 lbs. and running at 750 r. p. m. normal speed.

The crank case has a center partition or rib for carrying the center bearing and to insure an equal division of the oil. There are large passages or openings in the center wall of the case for equalizing the air pressure in the case. Each pair of cylinders have their cranks at 180°, so that when one set of pistons are on their inward stroke the other set are on their outward stroke, thus avoiding alternate compression and expansion in the crank case.

The crank shafts are made from a solid billet of forged steel of 35 to 40 point carbon, with bearings of liberal size. On the 28 and 30-h. p. motor the main bearings are 2 inches in diameter and the wrists 1¾ inches in diameter by 2 inches in length. On the 40-h. p. motor the wrists are 2 inches in diameter and 2½ inches in length, while the main bearings are 2¼ inches in diameter.

The crank case is cut with a substantial base for mounting, and an extra large handhole plate is provided on top of the case for inspection, adjusting, etc. All bearings have provisions for adjustment and lubrication, and are lined with anti-friction bronze that is claimed not to cut.

The four cylinders are supplied with gas from one carburetor, which is said to be automatic and to give the proper mixture of gas and air for all speeds and position of the throttle. The air valve and the valve controlling the gasoline supply are regulated automatically.



BRENNAN 4-CYLINDER MOTOR.

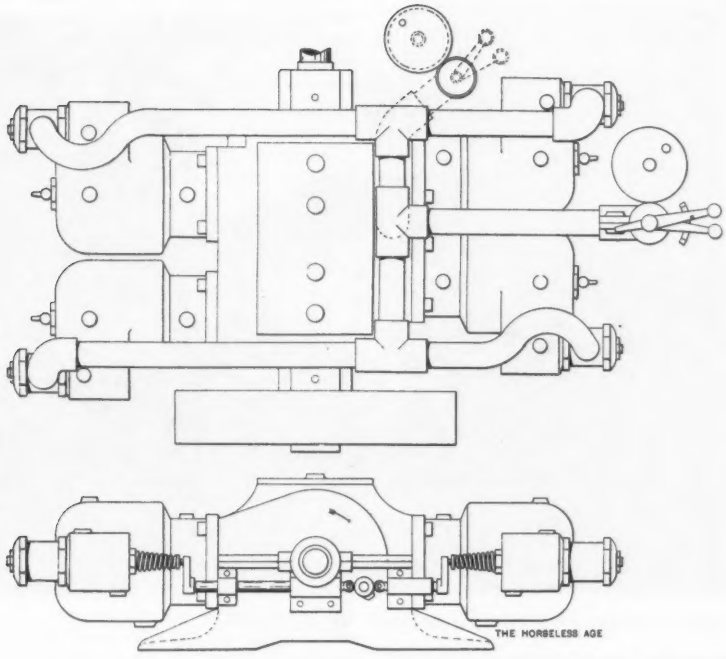


DIAGRAM OF BRENNAN 4-CYLINDER ENGINE.

The ignition timer is fitted on a stationary hub of the secondary shaft, and has sufficient tension to stay in whatever position it is put, with ample travel for early and late ignition. The contact cam is fitted with a hardened roller on a hardened shaft, so as to avoid wear on the commutator brush.

The connecting rods are made of steel, with interchangeable bronze bearings. On the wrist or crank pin end they are fitted with a hexagon castellated nut and cotter key, so that adjustment can be made to one-sixth of a turn. On the pitman end there is a binding screw with a split bush for taking up wear.

The gears for driving the secondary shaft are enclosed in the crank case, which keeps them well lubricated and protects them from dust and dirt. The cams for operating the exhaust valves are made from drop forgings and hardened, and operate against a hardened roller which is carried in the push rod giving the movement to the exhaust valve. The exhaust valve has one-quarter inch lead for opening, and closes on the center. The cam is secured to the secondary shaft by a key which runs the full length of the hub of the cam, and is secured by a lock nut.

Special attention is called to the finishing of the pistons, cylinders and rings. The pistons and rings, after being machined, are ground to size, due allowance being made for the unequal expansion of the piston at its opposite ends. The cylinders are bored in a special lathe, and at the same setting the flange on the cylinders is machined. The cylinder bore is finished with a floating reamer, and the cylinders are then ground by a grinder which forms a part of the special lathe for cylinder boring. The above method is found to produce round and parallel cylinders of uniform size. The rings are ground after they have been cut. This four-cylinder motor is especially intended for high powered cars and motor launches.

The New Renault Ignition.

The new 1905 model Renault touring cars, one of the first of which to arrive in this country we had an opportunity to inspect at Smith & Mabley's last week, are fitted with high-tension magneto ignition, which is an innovation for this firm. The system is rather complicated, but the apparatus is well made and differs considerably from any ignition arrangement we have ever seen. In starting the motor, the current is supplied by a dry battery of four cells, located in a polished hardwood box on the dashboard. The cells are of the square or prismatic type and occupy the same box with a trembler coil to which they are connected. At the side of the box is a small switch by which the batteries can be connected to and disconnected from the coil. From the bottom of the coil lead three wires, one of which is grounded nearby, at one of the dashboard braces. The other two pass under the dashboard and radiator, and through cleats secured to the engine apron, to a hard rubber switchboard secured to the forward end of the magneto. One is a primary lead and the other a secondary or high-tension.

The magneto is mounted on a forward extension of the engine base and is readily accessible when the bonnet is lifted, the more so as the radiator is located back of the bonnet. It is driven from the engine cam shaft through spiral gears without change of speed. The gears are completely inclosed and run in oil. The magneto itself is provided with self-oiling bearings at both ends.

We may here state that we cannot describe the apparatus in complete detail, because most of the parts are inclosed and hidden from view, and it was impossible to trace the connections without taking the whole apparatus apart, which, in view of its complication and the fact that none of the men at the garage understood it, was not deemed advisable. It is evident, however, that the magneto produces the jump spark direct, without coil, the same as the Bosch high-tension magneto. Besides, all of the outside connections can be traced, and a description of this part of the device will prove of interest, we believe.

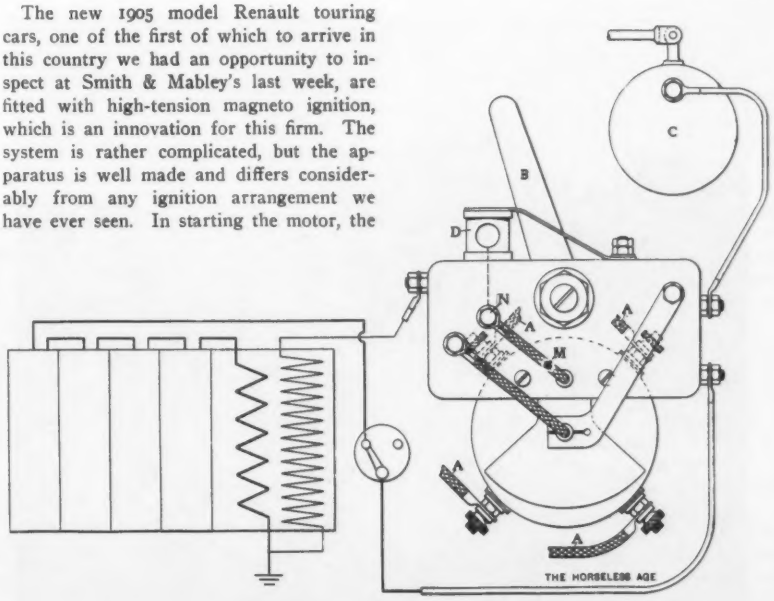


DIAGRAM OF CONNECTIONS.

LESSONS OF THE ROAD

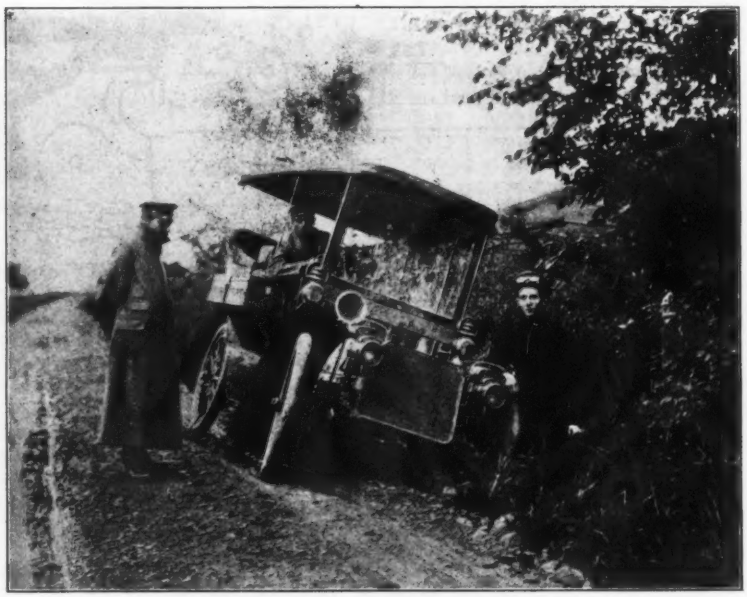
New York to Oconomowoc—A 1,200 Mile Automobile Tour.

By J. M. Hartshorne.

On Tuesday, June 16, after a fortnight of rain and in the face of leaden skies and muddy roads, I left New York in a recently imported touring car for a trip to Oconomowoc, Wis. My party consisted of a friend and two mechanics, one being a chauffeur who had run a similar car and whom I took along to instruct us, as neither my man nor I knew much about my car, having been out in it only once.

We made our start from Fifty-ninth street at 10 a. m., lunched at Peekskill, and, passing through Poughkeepsie, dined and spent the night at Millbrook. This was rather a roundabout way of reaching Albany, but as we were not in any special hurry, we had decided to see something of the Berkshires. Leaving the next morning at 10:25 we lunched at Great Barrington and afterward drove through Stockbridge and Lenox, and brought up at Pittsfield for the night. The roads, usually very good, were heavy with mud, but the views of course were beautiful, and we felt more than repaid for the loss of time.

As it rained all Wednesday night and until 10 o'clock Thursday we did not start for Albany until after luncheon. The State road over Lebanon Mountain was fine and the scenery exquisite, but from West Lebanon to Nassau the road was horrible. It had been repaired, which meant covering it with the mud from the ditches, and we had to wallow through it. It was slow work and we did not reach the Hotel Ten Eyck, at Albany, until 7:45 p. m.



In the Ditch Near Fairport.

Only one amusing incident occurred to enliven the journey. This was meeting a man with a mettlesome horse who scorned our advice to turn into his own yard and insisted on driving past, calling out, "I own this horse and I'll do as I please with him." He finally got by, but his wife had hysterics on one side of the road and he nearly had heart failure on the other.

As so many have made the run from Albany to Buffalo I shall not go into all the details of ours, but give the stopping places in a table at the end. Our only adventures during this part of the trip were due to the muddy roads. A little west of Schenectady we were caught in a heavy thunder storm, in the midst of which we skidded into a deep mudhole. Letting down the glass front and side curtains we sat waiting for the rain to let up. Just as it did, along came a negro with a pair of big black horses, and as he offered to pull us out for 50 cents we consented to be humiliated, both wheels on the right side being buried up to the hubs.

At Amsterdam, where we stopped for luncheon, we were told that the roads to the west were being repaired (!) and were impassable even for the local automobilists, so we applied for permission to use the towpath of the Erie Canal, and through the kindness of a member of the Legislature who lived in Amsterdam we secured it.

Our afternoon ride alongside the canal was delightfully novel and, much to our surprise, the views were fine, and we were almost sorry when Fort Plain was reached. Saturday we again used the towpath, reaching Utica early in the afternoon. As it was then raining hard we decided not to attempt to go any farther that day. The rain continuing all Sunday, we did not get away until Monday.

Although we had enjoyed the scenery and the good going on the towpath, the fear of skidding into the canal after so much rain, or of frightening some of the mules into it, forced us to try the road again. It was slow, heavy pulling all the way to Syracuse. Tuesday it again rained all day, but Wednesday being clear we started at 8:30, and, choosing the lesser of two evils, followed the towpath to Clyde, where a good luncheon, preceded by something with a cherry in it, somewhat restored our nerves, which had been sadly shaken by those fool-

In the Mire on a Boulevard Near Weedsport, N. Y.

ish mules, for almost every team we met that morning seemed seized with a wild desire to breast the raging canal, and only the exertions of my two men and occasional quarters given to the mule drivers saved me from being ruined, for of course drowned mules would have been exceedingly expensive. Taking to the highway after luncheon we were treated to heavy thunderstorms at Newark and Palmyra, and near Fairport we suffered from the effect of the rain, for we slid off the road into a deep ditch. Application at the neighboring farmhouses failed to secure horses, all being away, but just as we were getting anxious a farm wagon came along and pulled us out. Fifty cents gained us the farmer's approval. As though we hadn't had trouble enough, a rock, hidden in the mud, tore off the aluminum guard below the flywheel. This gave us a horrid fright, for if the flywheel were hit and the shaft bent we were out of business. Everything seemed all right, however, and we were soon on the 10 miles of beautiful road leading into Rochester, reaching there at 7:50.

SPRAKER'S, ON THE ERIE CANAL JUST WEST OF AMSTERDAM, LOOKING EAST.

Next day, on the way to Buffalo, we met a man to whom, if I had his name, I'd like to send a medal for his display of courage and brains. When we were still a full half mile away this yokel unhitched his horses, leaving a heavy load of stone in the middle of a narrow piece of the road. All efforts to induce him to put in his horses and pull to one side were unavailing, and only met with the answer, "H—l, I suppose you fellows think you own this road." Unable to move the man or the wagon we had to take to the ditch and by all leaning to "windward" we got by without upsetting. Hereafter I may include some dynamite cartridges in the repair kit.

In Buffalo we lost half a day by having the rear mud guards raised some 2 inches. They were so low that they kept bumping down on the tires and scraped both outer shoes so badly that these had to be left in Cleveland later on to be recovered.

The road from Buffalo to Erie was very good. From Fremont to Toledo the perfectly straight but miserable turnpike would have been very monotonous had it not been for the many oil wells we passed. About 15 miles west of Toledo, between Holland and Delta, we got stuck in deep sand, but a pair of white horses, tooled by a barefooted farmer, pulled us out, when assisted by the engine. This worthy man asked only 25 cents for his services and was so pleased on getting a half dollar that he offered to come along and help us through "a bad spot a bit farther along." We thanked him, but told him not to come unless we megaphoned him. By following his advice of sticking to the ruts, which, although they looked bad, had a hard bottom, we pulled through without further trouble and were soon on a splendid road, by which we reached Bryan.

STUCK IN THE SAND 15 MILES WEST OF TOLEDO—"TWO HORSE POWER."

On Tuesday, June 30, we had our first runaways. Near Butler, Ind., we slowed down on meeting a farmer driving a cultivator, and when his horses tried to climb the fence the engine was stopped altogether and my men ran forward, got the horses back in the road and straightened things out. The horses finally passed us very quietly, without even being led, and the farmer thanked us very profusely. But, when about 40 yards past, one of the horses reared, and in a twinkling they were off. After running a quarter of a mile down the main road they turned into a lane and finally jumped a fence, cultivator and all, when, concluding that they had shown sufficient spirit, they stopped and began grazing.

The farmer followed quietly after his horses and never once looked back. I should have felt better if he had shaken his fist at us; still, as we hadn't started the engine, we were not exactly responsible for the runaway, though we undoubtedly were the cause. As no great damage had apparently been done, we went on and some ten minutes later met a man driving a mule in an old runabout which reminded us of "the wonderful one horse shay." When about 50 yards away the mule put up danger signals in the form of a pair of long ears, so we slowed down. The driver jumped out, led the mule to one side and

beckoned us to pass. We went ahead slowly, but when about 20 yards away the mule suddenly wheeled and bolted. The man held on to him for about 30 feet, then fell, and the wagon passed over him. We went up close and then all jumped out and ran to him. He was covered with blood, and I feared he was seriously injured, so while the others carried him to the side of the road I rushed back to the car for a flask of whiskey. When I returned, dreadfully frightened, the others told me that the fellow was very drunk, and uninjured except for a bloody nose. We picked up a black looking bottle that had fallen out of his pocket, which he informed us was fine blackberry brandy and that its mate was in the wagon. I suggested that he wipe off some of the blood, but he said no, that his dog, a small hound, which he held in his arms, was a "bloodhound and would lick it off." He added that there were some fine pups in the wagon and expressed the hope that they had not been spilled out. We finally left him reclining against the fence, after promising to find the mule and send him back. We didn't have much hope of finding the wagon except in pieces, and we expected to pick up pups all along the road, but about a half mile farther along we saw the mule standing quietly by the side of the road with his danger signals drooping and the wagon apparently intact. So, backing into a side road, one of the men was sent to get the mule. When he returned we photographed the outfit and then examined things. The pups seemed all right and so did the other bottle of blackberry brandy. The mule was driven back to his owner, but as he preferred reclining on the grass to driving home, the mule was tied to the fence and we went on our way rejoicing.

We reached South Bend that night and Chicago the next, without any further adventures. As my friend was booked to sail for Europe in a few days, my wife and son joined us there, and next day, after seeing him off and lunching, we started for Highland Park, which was reached by a beautiful drive of 23 miles through Lincoln Park and over the Sheridan road, a boulevard running along the shore of Lake Michigan. The next day we passed through Kenosha, Racine and Milwaukee and arrived at Oconomowoc at 6:52.

Thus ended a trip of some 1,200 miles, for the most part through beautiful and interesting country.

Where we had expected to find the best roads, from New York to Rochester, they were the worst. Of course, we had started after a long period of rain, and had several stormy days before reaching Rochester, but it does seem as though the great State of New York might do as much for its people as little New Jersey and give us macadam roads fit to travel on in any kind of weather. From Rochester west the roads were good, except for short stretches, and from Toledo they were generally fine. We had fairly good weather after leaving Rochester, so of course I can't say how these roads would be under the same conditions that we had farther East.

The people whom we met were all extremely kind and courteous, with the single exception of a German farmer near Hammond, Ind., who absolutely refused to tell us our road, though he did suggest our going to h—l, and we hadn't even frightened his horses!

We made only one repair to the engine on the road. This was the replacing, near Milwaukee, of one of the small springs on the make and break of the sparking system, and took about one minute. The only other repairs during the entire trip were the resetting, on the second day, of the magneto, which was one tooth too far forward, and the smoothing of the pins on which the weights worked in the float feed carburetor; the taking up of some play in the steering wheel, twice replacing the aluminum mud guard under the flywheel, raising the rear mud guards and sending the two shoes to be recovered, and replacing four punctured tires.

As will be seen from the subjoined table, we traveled 1,218 miles, without counting some detours that were made because of broken bridges and losing our way, and we used 120 gallons of gasoline at a cost of $24.

A total of 1,218 miles in 110 hours and 22 minutes. From this should be deducted the time lost in being towed out of trouble and in replacing the four punctured tires. Two of these punctures occurred on the inner side of the tubes, and so could not have been due to nails. My men thought they were caused by the heat (it turned hot west of Toledo) swelling the tires. Does this often happen?

Taken all in all, the trip was most enjoyable. We had from fair to good accommodations everywhere, and the only drawback was the horrible condition of the roads to Rochester, due to the long continued rains.

	Miles.	Hours.	Minutes.
Tuesday, June 16, New York to Millbrook	91.5	8	17
Wednesday, June 17, to Pittsfield	61.5	5	55
Thursday, June 18, to Albany	39	5	10
Friday, June 19, to Fort Plain	60	6	45
Saturday, June 20, to Utica	40	4	..
Sunday, June 21, Rain	..	..	..
Monday, June 22, to Syracuse	49	5	45
Tuesday, June 23, Rain	..	..	..
Wednesday, June 24, to Rochester	82	10	35
Thursday, June 25, to Buffalo	72.5	6	30
Friday, June 26, to Dunkirk	50.5	4	30
Saturday, June 27, to Cleveland	145	11	45
Sunday, June 28, to Fremont	83	6	55
Monday, June 29, to Bryan	100	9	15
Tuesday, June 30, to South Bend	110	8	10
Wednesday, July 1, to Chicago	111	7	30
Thursday, July 2, to Highland Park	23	1	45
Friday, July 3, to Oconomowoc	100	7	35

The Motor Horse, Ltd., has been registered in London with a capital stock of £100,000 to replace ordinary horses with motor horses.

The Official Automobile Blue Book for 1903.

The new edition of this valuable guide for tourists has recently been issued by the Official Automobile Blue Book Company, 31 West Forty-second street, New York. The book, which comprises about 400 pages, is bound in a soft leather cover and is of convenient size to be carried in any coat pocket.

Ten pages of the blue book are devoted to State and Federal laws and customs regulations. Attention is called to a bill which will be enacted into law by the next New Hampshire Legislature. The laws governing the use of automobiles on the highways of Vermont and New Jersey are printed in full. Should any of the State laws which are passed later on permit the local authorities to restrict automobile traffic, these restrictions will be published by the company in the form of special bulletins. Complete lists of the customs duties levied on automobiles imported into the United States or foreign countries as well as the United States customs regulations are published.

The greater part of the book is devoted to the important routes in the various "sections," of which there are twenty-seven in all. Running directions, towns en route, distance between towns, character and condition of roads and supply stations and their ratings are published in connection with each route. Even without a map any tourist should be able to find his way, provided he follows the "running directions." A complete list of storage, repair and supply stations and of "blue book" hotels is appended.

The automobile blue book is destined to become to the touring motorist what the Baedeker publications are to the European traveler.

We have so far not yet seen the usual estimate of how many millions of francs' worth of autos were sold as a result of the Paris-Madrid Race. Probably in this case it is more a question of how many prospective sales were lost by the race.

New Vehicles and Parts.

The Compound Light Touring Car.

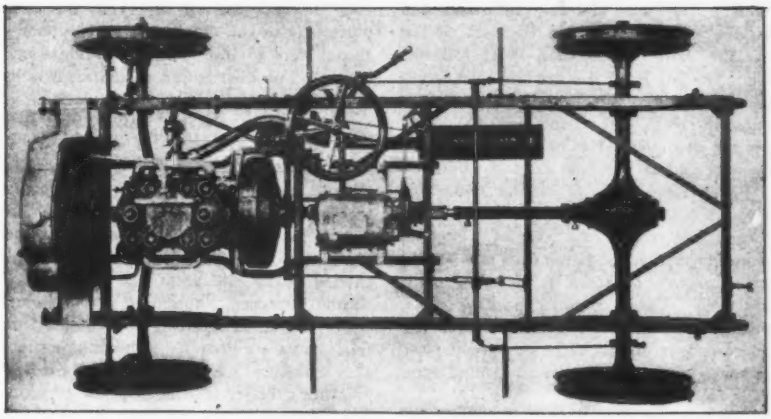
By Albert L. Clough.

The E. H. V. Company, of Middletown, Conn., manufacturers of the "Compound" motor, are in the market with a 12 to 15 horse power, four passenger, light touring car, equipped with side entrance tonneau. the removal of which and the substitution of a torpedo back converts the vehicle into a runabout of very attractive lines.

In most respects this car conforms in design to ordinary approved practice, its exclusive feature being the use of a three cylinder motor, embodying the compound principle, which principle consists in utilizing the exhaust from a high pressure cylinder for the production of additional power by expanding it in a low pressure cylinder instead of allowing it to escape uselessly into the atmosphere.

The car has a wheel base of 82 inches and a tread of 54½ inches, and is fitted with 28 inch wheels, shod with 3½ inch detachable tires. Both front and rear springs are of the semi-elliptic variety, 34 inches in length. Aluminum is the material employed for the body, which is ironed for either a canopy or Cape top and provided with standard sockets for side lamps and a gas searchlight. The standard finish is dark maroon for the body, with a brass bead and lighter maroon for the running gear, with black and gold striping. Dark green or black leather is used for the upholstery and laminated wood mud guards are supplied.

The frame is of pressed steel, hot riveted and stiffened by gusset plates. A tubular front axle is employed, with forged knuckles and yokes, pinned and brazed. Steering is of the Elliot type by means of an inclined column and wheel actuating a dustproof irreversible device of the internal worm and wheel variety.



Plan of Chassis of the Compound Light Touring Car.

The tubular, encased rear axle, which is of the bevel driven type, is of very ample size and strongly trussed. A spur differential is employed, and the bevel drive gives the rear wheels one turn to each 3.61 turns of the engine on the high gear. The internally expanding rear hub brakes are actuated by a side lever, which also releases the clutch. Frictional surfaces of cast iron on steel are here employed. Three forward speeds and a reverse are provided by a sliding pinion change speed device, carried in an aluminum case mounted upon the subframe. The gears are carbonized and hardened, and chemically cleaned to remove the scale, which otherwise is likely to damage the bearings. When running upon the high speed the drive is direct and the side shaft is thrown out of gear. All speeds are secured by means of a single lever at the operator's right, moving over a notched quadrant.

The clutch is of the inverted, leather lined cone type, and is released by means of a pedal or by the brake lever. A pedal brake acts upon a drum on the drive shaft. This is of the strap type, self freeing and double acting, with frictional surfaces of bronze on steel. The vertical, three cylinder motor is mounted in front under an aluminum hood, and is carried on the subframe by six feet cast on the aluminum crank case. The three cylinders, valve chambers, water jackets and heads are cast integral, with the exception that the head of the low pressure cylinder, which is not water cooled, is a screwed in plate. The fore and the aft cylinder of this combination are high pressure cylinders, operating upon the ordinary Otto cycle, while the middle one is the low pressure or compound cylinder. Through bolts secure the cylinder structure to the crank case, which has partial oil partitions in its base, and two removable hand hole covers on each side. The high pressure cylinders are of 4 inch bore and the low pressure cylinder is of 7 inch bore, so that its area is about three times that of the high. A 4 inch stroke is employed.

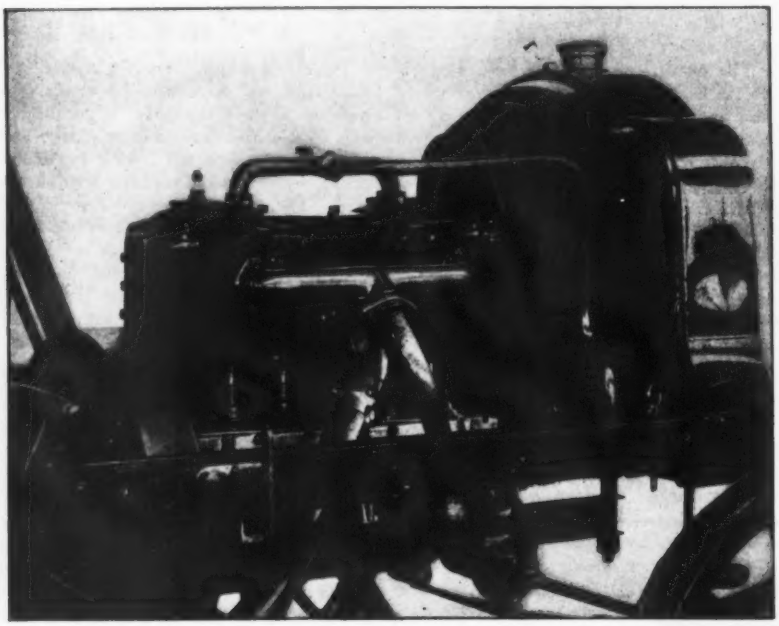
The crank shaft is hand forged and its bearing portions are ground to size. It has two throws for the high pressure cylinders upon one side, and between these a throw for the low pressure cylinder upon the other side of the shaft. Accurately adjusted counterweights, integral with the high pressure cranks, compensate for the extra weight of the large, low pressure piston. A bearing is provided at each end and between each two throws, making four bearings in all. Compound bronze and babbitt bushings with square bases are used. The two horizontal cam shafts (one upon each side of the engine) are actuated, through idlers, from a gear on the crank shaft and are fully enclosed. They run in bronze bushed bearings and their cams are carefully hardened. There are four mechanically operated valves upon each side of the motor. These are interchangeable, as are

The Compound Light Touring Car.

their springs and the cam followers and guides. As viewed from the seat of the car the valve arrangement is as follows: Upon the left hand side are the inlet valves of the high pressure cylinders and their exhaust valves, and on the right hand side are the two inlet valves of the low pressure cylinder and its two final exhaust valves.

These valves are all readily removable through holes closed by screw caps. Drop forged steel connecting rods of I section, bronze bushed at the piston ends and bushed with bronze and babbitt at the crank ends, are used. Three eccentric packing rings, made of special metal, are used upon the high pressure pistons and two upon the low pressure piston. These are all ground upon their faces and sides.

The flywheel is secured to a flange integral with the crank shaft and is carefully balanced on the shaft. Upon the front end of the right hand cam shaft is carried the timer, which is of the steel ball contact type, and a pulley upon the rear end of this shaft drives the mechanical lubricator. The circulating pump is of the gear type and is driven by an enclosed gear on the left hand cam shaft. The exhaust fan is driven by belt from the crank shaft. A single Schebler carburetor furnishes mixture for the two high pressure cylinders, through a copper pipe. All water connections are of copper with copper and asbestos gaskets—no rubber hose being used. The radiator is of the vertical tank type with a very large number of horizontal, flanged air tubes, and is assisted by a fan. Lubrication is effected by means of a three outlet mechanical lubricator with sight feeds, mounted upon the dash. One of its feed tubes goes to the low pressure cylinder, which has an oil retaining ring cut in its inside wall. The other two maintain the oil supply in the compartments of the crank case corresponding respectively to the two high pressure cylinders. The distribution of lubricant is by the splash system. The jump spark plugs are screwed into the inlet valve cap of each high pressure cylinder. A double coil is mounted upon the dash, and a switch, upon the coil case, allows of the use of either of two sets of four dry cells or of the two sets in multiple. The batteries and the 16 gallon, lap jointed, copper gasoline tank are carried under the front seat. A permanently attached, automatically released crank is used for starting and compression relief cocks are provided on each high pressure cylinder. The exhaust from the low pressure cylinder is at such a low pressure that practically no muffling is required. Copper pipes, free from sharp bends, lead the exhaust gases to the rear of the vehicle.



THE COMPOUND ENGINE AND ITS MOUNTING.

The car complete weighs about 1,650 pounds.

The action of the compound motor is as follows: At the end of each explosion stroke in either of the high pressure cylinders, valves open which allow communication between the active high pressure cylinder and the low pressure cylinder. Since the piston of the low pressure cylinder has a motion 180° out of phase with the high pressure pistons, the piston of the low cylinder is just ready to make a down stroke when the high pressure piston has reached the end of its power stroke. The low pressure piston is thus urged downward by the exhaust pressure of the high pressure cylinder, and useful work is done. At the end of the stroke of the low pressure piston the final exhaust valve opens and the gases escape to the atmosphere.

A power impulse is obtained in the low pressure cylinder which corresponds, in time, to the exhaust stroke of each high pressure cylinder, and there are thus two impulses in the low pressure cylinder per cycle. As these impulses occur when no work is being given out by the high pressure cylinders, there is a constant production of power in the engine. The final exhaust contains very little heat, and this should indicate the utilization of a considerable fraction of the heat which would be thrown away if the engine were running simple rather than compound.

The 1906 Stanley Steamer.

BY ALBERT L. CLOUGH.

The Stanley Motor Car Company, of Newton, Mass., have brought out the 1906 model of their steam touring car, known as Model F and rated at 20 horse power. This is a double side entrance tonneau vehicle, with seating capacity for two persons in front and three in the tonneau; its wheel base is 100 inches, and its gauge 54 inches.

The car is equipped with 34 inch twelve spoke artillery wheels, shod with 3½ inch tires. Double elliptic springs are employed both in front and in rear, all of 36 inches length, made up of five leaves of 1½x¼ inch oil tempered steel. The front axle is of steel tubular construction, 2¼ inches in outside diameter and 12 gauge, and stiffened by means of an underrunning truss of one-half inch steel rod. The drop forged Elliot steering forks are pinned and brazed to the axle ends, and are given a rake of about 12 degrees in order to render steering easy. Ball bearings employing three-quarter inch steel balls are used in the front wheels. Steering is effected by means of an inclined column and wheel, giving motion to a slightly beveled steel pinion meshing with a phosphor bronze beveled sector. The sector actuates a rod which is connected through a universal joint to the parallel rod uniting the two steering cranks. All joints in the steering linkage are made with taper pins in conical holes, so that lost motion may readily be taken up.

REAR AXLE AND DRIVE.

The rear axle is of the live type, with spur gear drive. Its steel encasing tube is of 2½ inch outside diameter, and of 12 gauge, and is trussed by a one-half inch steel tension member. The axle shafts are of 1⅜ inch steel, and run in four sets of three-quarter inch steel balls—two under the springs and two at the gear case. Spring retained oilers are fitted to these bearings. A three pinion bevel differential is employed. The driven spur gear on the differential frame is of phosphor bronze, and the driving spur pinion of the engine is of steel. The customary gear ratio is about one and three-quarters engine turns to one rear axle turn, but gears ranging from 1 : 1 to 2 : 1 may be had in order to fit the car for use upon very level, smooth roads where great speed is desired, or to give it

great tractive effort on very hard, hilly roads. The axle tube carries the supports for brake shoes acting upon drop forged drums bolted to the wheel hubs. Internally expanding bronze shoes are employed, actuated by means of a ratchet retained hand lever at the operator's right. Front and rear axles are united by means of two hickory perches of 1½ inches diameter. These perches are fastened to the axles in the following manner: The wood is slightly reduced in diameter at both ends and steel ferrules of considerable length are driven over this portion. This ferrule is pinned through the wood in two directions diametrically opposite, and the end of the ferrule, which is tapped out, is secured to a fitting on the axle by a plug which screws into it. A V truss, formed of two tension members originating near the ends of the rear axle and uniting at the central point of a cross member joining the two perches, is used.

The body is built of seasoned oak and the sills are specially designed at their different points for the stresses they have to bear. No frame, proper, is employed, the body being carried directly upon the springs. The ordinary body finish is Brewster green with black moldings, and the running gear is finished in primrose yellow. Laminated wood wheel guards, united by a running board, form a continuous fender. The hood, under which the boiler is placed, is of brass trimmed sheet steel, hinged on the dash and capable of being easily lifted. A snap catch on each side holds the bonnet to the sills and prevents all rattle. The front of the hood is rounded in order to minimize air resistance.

THE BOILER.

The fire tube boiler, as previously stated, is located in front under the hood. It is supported upon a steel ring which is bolted to the sills. Its construction is substantially unchanged from that employed in the 1904 model, a description of which appeared in THE HORSELESS AGE for December 2, 1903. In the present car the dimensions of the boiler are greatly increased, the shell being 23 inches in diameter, with 756 copper tubes of one-half inch diameter and 14 inches length, giving a heating surface of about 120 square feet. At the rate of 6 square feet per horse power 20 horse power may be attributed to this boiler. It will be remembered that the Stanley boiler is provided with means for freeing the steam of entrained moisture, and of considerably superheating it. This is accomplished by subjecting it to the heat energy in the water, and by contact with the burner flame.

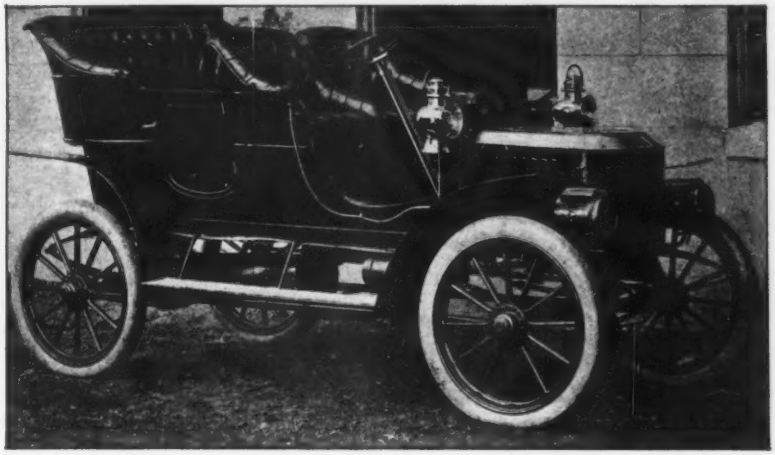
The boiler is well lagged with asbestos and the gases of combustion are carried downward from its top by a sheet iron flue, which runs under the body of the car and discharges at the extreme rear in a downward direction. The float water level indicator is placed at the right of the boiler and its index passes through the dash to a position convenient for observation. A fusible safety plug is fitted to the boiler and the pop safety valve, under the boiler on the left, is usually set to open at 600 pounds per square inch. The burner, which is a larger form of that used by the Stanley Company for some years, is fed by two jets blowing into it from the extreme front of the car, where they are perfectly accessible. The pilot light jet is directly between the two main jets.

THE ENGINE.

The double cylinder, double acting engine is placed horizontally, under the body, toward the rear of the car. Its frame is extended rearwardly and terminates in two circular straps which are adjusted to encircle the rear axle encasing tube and hold the driving pinion on the engine crank shaft in perfect mesh with the driven spur gear on the differential. The engine is free to move slightly radially about the axle without disturbing the driving conditions. At its head end the engine is supported by means of a laminated steel strap attached by its upper end to the body. No material changes have been made in the construction of the engine, but its size has been greatly increased. Cylinders of 3⅝ inch bore are employed and a stroke of 5 inches. The cylinders and steam chest are cast integral, except front and rear heads, which are screwed in. A removable cover gives access to the slide valves, which are operated by Stephenson reversing link motions. The cylinders, pistons, the two rings of each piston, the slide valves and valve seats are all carefully ground. Large balls are used throughout for main bearings, crank pin bearings, cross head slides and eccentric straps. The only plain bearings are those of the wrist pins, which are conical and readily adjustable. The cut-off may be set for full stroke at starting or for extreme hard service, or may be reduced to three-eighths stroke for normal running conditions.

A removable burnished copper casing, with a large slide on each side to give access to the moving parts, completely encloses the engine, driving gears and differential. Steam is conveyed to the engine from the forwardly mounted boiler by means of a pipe which runs within the sheet iron flue carrying the hot boiler gases to a point opposite the head end of the engine. A carefully ground universal coupling joins this pipe to the steam chest, and gives the requisite flexibility. The exhaust leaves the engine through a flexible rubber hose connection, and passing into the smoke flue produces the forced boiler draft as well as reducing the visibility of the exhaust.

The gasoline feed system is substantially unchanged. Under the rear seat is located the main gasoline tank, which has a capacity of 15 gallons. This tank is not under pressure at any time. The fuel is forced from the supply tank, by means of a power gasoline pump under the control of an automatic diaphragm and bypass, to a seamless steel tank of small dimensions, which is the pressure tank of the system. This tank is in communication with a similar tank in which an initial air pressure is developed by means of a bicycle pump. The air pressure in this tank acts to keep the gasoline in the former tank under pressure even though the gasoline pump is not working.



THE NEW STANLEY STEAM TOURING CAR.

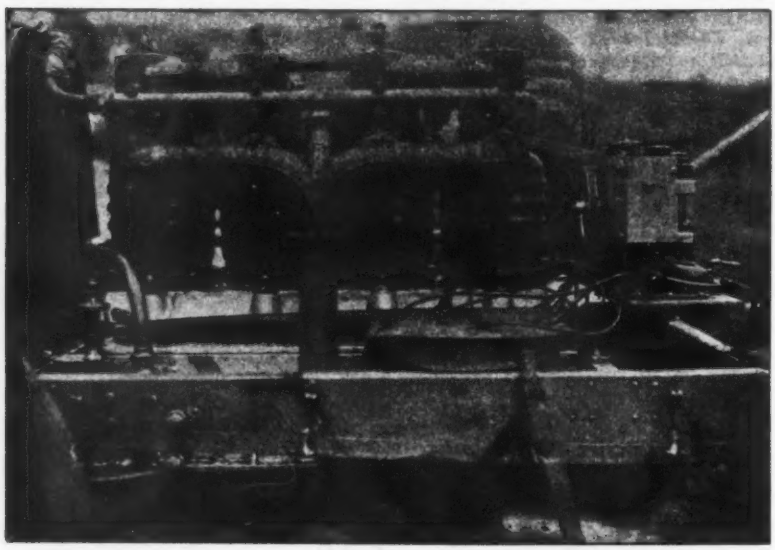
AUXILIARIES.

In this car all auxiliaries and piping are located in a tight, shallow closet formed by the removable footboard and the flooring of the body. Under this closet passes the flue conveying the hot boiler gases, and this arrangement, in conjunction with its proximity to the boiler just in front of it, is said to prevent the possibility of any pipes freezing even in extremely cold weather.

The engine operates a vertical rocking link, which by means of a horizontal, forwardly extended rod gives a rocking motion to a horizontal transverse shaft lo-

cated in the above mentioned closet. This rocking shaft operates the water pump, gasoline pump and mechanical lubricator. The hand gasoline and water pumps are also located in the heated closet. A tank of 30 gallons capacity under the front seat holds the water supply, from which it is pumped to the boiler through a heater coil in the uptake. The usual bypass is employed for water supply regulation. A steam siphon, placed under the hood, is used for filling the tank. About 10 feet of rubber hose, fitted with a strainer suction, is carried upon hooks in the side frame, from which it may readily be removed when the siphon is used for securing water from troughs or brooks.

The lubricator draws its oil from a copper tank of 1 gallon capacity located in the hot closet near the boiler, and discharges it into the steam pipe near the steam chest. This oils the cylinders, and there is usually sufficient escape of lubricant around the pistons to materially assist in the oiling of the reciprocating parts of the engine. This lubricator is of the ratchet and pawl type, driving a spiral cam which gradually compresses a spring. The spring, upon its recoil, operates a ram that forces the oil against boiler pressure. In all the piping for gasoline, water and oil, annealed copper tubing is employed, and elbows, tees and other plumbers' fittings are avoided, so far as possible, as likely to develop leaks The pipe is smoothly bent where turns are required.



Fifty Horse Power Pope-Toledo Engine.

CONTROLLING DEVICES.

The controlling devices of the car are thus arranged: Upon the steering column is located the throttle, which traverses a quadrant with a latched "off" position. The lever operating the water bypass is also upon the column. A pedal, under the operator's right foot, operates a brake upon the differential frame, which is enclosed in the copper engine casing. Under the driver's left foot is the reverse pedal. The steam and gasoline pressure gauges are placed upon the right hand side of the dash and under them are the wire handles of the valves controlling the fuel supply to the main burner and pilot light and the steam supply of the siphon. Between the gasoline shut-offs is the stem of the auxiliary throttle, which is designed to be operated by means of a removable key. As already stated, the water level index is also upon the dash, as well as a gauge glass showing the height of the water in the supply tank. Projecting through the footboard near the heelboard are the main gasoline valve and the shut-offs of the hand gasoline pump. The shut-off of the hand water pump is reached by raising a section of the floor board.

The weight of the car is given as about 1,500 pounds, without water or gasoline.

The Pope-Toledo Fifty Horse Power Engine.

The photograph herewith shows the 50 horse power engine of Dingley's Pope-Toledo racer, which made the best time in the recent Vanderbilt Cup Eliminating Trials. It will be noticed that it is of four cylinder construction, and, at least so far as outside appearances go, embodies all the distinctive features of the Pope-Toledo touring car engine, including the corrugated sheet copper jacket, automatic inlet valves and planatic radiator. It is stated that many of the parts employed on the car are stock touring car parts, which, since the Pope Motor Car Company manufactures cars of as high as 45 horse power, is not surprising. The ignition is by jump spark, the spark plugs being screwed laterally into small vertical fittings which are themselves screwed into the cylinder heads and into the top of which the compression cocks are fastened. This saves, of course, one boss in the combustion chamber casting.

The Witherbee storage battery which furnished the current for ignition is seen in the foreground, while on a board over the flywheel are mounted the automatic lubricator and the spark coil. Along the side of the crank chamber runs a tube of insulating material in which the low tension leads from the commutator run to the spark coil. The carburetor is placed low on the right hand side of the engine, and draws warm air through a tube of considerable length, the mouth of which is located directly over the exhaust Y. The circulating pump is located on the left hand side of the engine, forward, and is hidden from view in the photo by the frame, but its location is indicated by the delivery pipe, which runs across the engine in front and communicates with the bottom of the jackets at the right hand side. The return of the water from the top of the combustion chambers to the radiator is also plainly seen in the photograph, and is most direct.

Reo 1906 Models.

Among the new models of the Reo Motor Car Company, of Lansing, Mich., just announced, is a five passenger, 16 horse power light touring car, with side entrance detachable tonneau. Only few changes from the design of last year's light touring car have been made, one being the adoption of an improved oiling device which feeds automatically in proportion to the speed of the engine; another is an improved short contact commutator. The body has been made lower in the back, larger, wider and with a more tapering hood. The other new Reo model, the 8 horse power folding rear seat runabout, has already been illustrated in these columns. It can readily be converted into a two or four passenger vehicle.

Herz Steel Armored Ignition Cable.

Herz & Co., 187 Elm street, New York, have brought out a new steel armored ignition cable for which patents have been applied for in all countries. Several layers of rubber alternate with an insulating compound, and the whole is covered on the outside with a strong armor of steel which protects the cable against injury, but does not interfere with its flexibility. The steel protection of the cable is grounded, so the cable acts as a condenser, and is claimed to increase the ignition spark, and if used for primary connectors, to reduce the extra spark at the vibrator points.

COMMUNICATIONS

Account of the Boys' Auto Trip.

Editor HORSELESS AGE:

Although THE HORSELESS AGE is comparatively a new-comer at our house, I always give it preference to the three other mechanical publications which I subscribe for, and I read each issue with great interest. What I like particularly are the departments of "Lessons of the Road" and "Touring Routes."

Consequently I thought that you might be interested in this brief contribution concerning a short trip I took about a month ago, when I brought our machine here. It was from our summer cottage at Westbrook, Conn., to our winter quarters here at Flushing.

The car was bought with the understanding that I should care for it and be responsible for its "getting there." I am a boy sixteen years old, and my chum who made the journey with me is a year younger. We made our preparations a day before the start. That evening everything was all ready for an early start. Everything was thoroughly oiled, the chain graphited, tanks filled to their utmost capacity, the body clean and all brass shining. The tonneau was full, and held much more than the avoirdupois equivalent of two passengers. Here we had five gallons of gasolene, three gallons of oil, a twenty-pound chest of tools, a lot of old and new dry cells, some extra inner tubes, two suitcases, a bag of golf clubs, numerous other packages, etc., etc. With everything aboard the little 10-h. p., single cylinder car was pretty well loaded. We two boys weighed about 255 lbs.

The next morning, after a good, hot breakfast, we got aboard and left the barn at 5:13 A. M. The straw had decided the night before that my chum, Fritz Fiske, should have first turn at the wheel, so he was driving now. It would be my turn at East River, about 12 miles west. We alternated in this manner for the whole trip, each fellow having a straight run of about 12 or 14 miles.

We were now off on our longest journey, and maybe we weren't joyful! We sped along merrily through the cool mists of the morning, and had a clear road for miles. Clinton, the first village out, we made in record time. A few minutes later we had a brush with a rabbit for a short distance, but bunny soon surrendered and dived into the underbrush. At East River we stopped, did some hurried oiling, and were off again, with myself at the wheel. Everything was going finely, and we were in high spirits until we reached Guilford, about 18 miles out, when we thought we could detect a slight loss of power. The motor never missed fire, the explosions were regular, but some little thing was out of the way. We meanwhile maintained a good gait, but were annoyed at the conduct of the motor. When Branford was reached, at 6:45, the mystery was cleared up. We left the motor running while oiling up, and while I was oiling the valve levers, with the footboard up, Fritz gave a cry of exultation and pointed to the spark plug. The connection had broken and the spark was jumping a gap of *almost an inch* at every explosion. We immediately stopped the engine and made a good and lasting contact. But what puzzled us was why she never missed an explosion during eight miles of running. I might say here that our batteries were new at the start, and we alternated the sets at each relay.

New Haven was reached at 7:22, and the next incident of the voyage occurred at Savin Rock, about four miles out of the city. Here, while oiling up, we allowed the motor to stop. A few minutes later, when ready to start up, I confidently inserted the crank, but there was "nothing doing." A hasty examination showed that both pawls in the starting rachet had dropped out and the crankshaft was not turning at all. We were not at loss for an expedient, for the breaking of the starting chain a few weeks before had made us wise. So, hailing a couple of fellows from a nearby saloon, we all began to push. Then I threw in the clutch. After numerous trials, during which it was necessary to open the relief cock, we got the motor going. We gave the fellows a quarter and hopped aboard and were off. It may be easily imagined that at the slightest sign of the motor's slowing down we would go back to first speed, rather than stall the motor. At 8:55 we hauled into Milford and stopped in front of a repair shop to inquire how long it would require to rig up some pawls. The fellow assured us "only about half an hour." So we stopped the engine and Mr. Mechanic crawled under the car and looked at the ratchet for about five minutes steadily. I could see that he was no good and mildly suggested that we had better have it fixed up at Bridgeport. He was glad to give the job up, and we got a mob of school children who were looking on to give us the required push, and we were off again. We arrived at Bridgeport at 9:46, but were unable to get the pawls here. As we were leaving this place we noticed that the radiator was becoming pretty hot from the continued running and necessary slow-going through the city. We therefore hauled up at a horse-trough and administered cold water to the tank, while the petcocks on water jacket, tank and circulating pump were allowed to be open. When at last the water became fairly cool at the water jacket, we closed the cocks and again proceeded.

Through South Norwalk at 11:08 and Stamford at 11:45 we kept on without a stop. After leaving Stamford we began to eat our luncheon, of which we had a most bountiful supply. (This meal was in progress from Stamford to Pelham.) New Rochelle was reached at 1:35 P. M., and then our luck failed us. We were going along a fine road of white brick and were just preparing to rush a hill, when a sudden and awful crash and crunch from below sent our hearts to our throats. We immediately stopped the motor and got out. Our stout chain was scattered all over the road for a hundred yards back. Not a piece six inches long remained. While we were surveying the wreck, a trolley bound for Mt. Vernon came by, so I hopped on, yelling to Fritz to collect the links and rollers and watch the car. The trolley passengers thought it a great joke, but my spirits were not very high. In a few minutes we reached Mt. Vernon. I telephoned my father in New York and explained the situation. He said he would telephone the garage for a man, and meanwhile I telephoned and telegraphed the garage myself, to make things doubly sure. I gave the location of the car as best I could, but I was in a strange place and my directions were, perhaps, rather vague. About four-thirty father arrived on the scene, but no auto-man. Finally, about six o'clock, a couple of Dagoes came along with a team, and one of them asked if he could tow us to town. We offered him a dollar, which he accepted with alacrity (he didn't know his business), and in one half hour he had us landed in front of the Mt. Vernon Auto Station. After supper father took the train home, and we boys put up for the night at a little German hotel. Next day at one o'clock our man showed up with chain and pawls, and at four-thirty we were off again. The man had come up the previous afternoon, but not being able to find us, had gone back again.

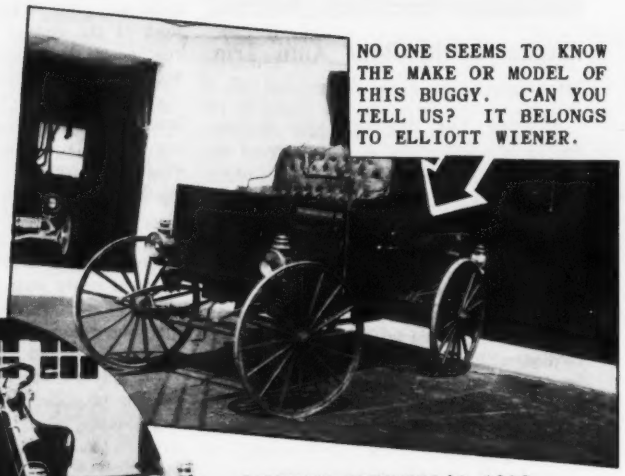
We had a good run down to New York City, stopping but once in Central Park, when we tightened the chain. Going down 99th Street I never saw more urchins in my life—all yelling, "Git a horse!" Upon looking round we saw a whole mob of kids hanging on the tonneau. When we finally scared them off (and they stuck like leeches), the stones began to fly. One struck the horn beside Fritz and another hit the back of my seat, but luckily we had soon passed. A minute later we were at the ferry, where father met us as agreed. When we pushed the car off the boat at College Point, it was quite dark, and after lighting the lamps, we struck a good gait which we maintained until we reached our place in Flushing, at seven-thirty.

Fritz and I both voted the trip a great success and were proud of our achievement. But next spring when we go back to good old Westbrook, we hope to cut down the time for the 125-mile trip.

NATHANIEL S. SEELEY.

FROM OUR MEMBERS

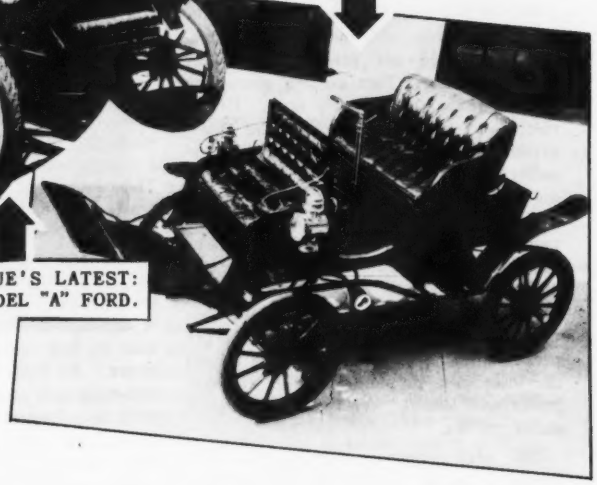
DAVID GRAY JR.'S 1903 CADILLAC.



NO ONE SEEMS TO KNOW THE MAKE OR MODEL OF THIS BUGGY. CAN YOU TELL US? IT BELONGS TO ELLIOTT WIENER.

LINDLEY BOTHWELL'S 1903 PIERCE MOTORETTE.

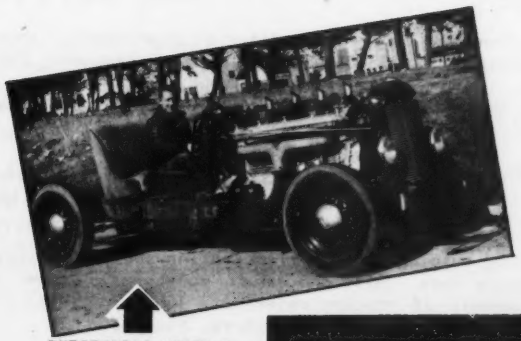
DAVID GRAY JR.'S 1903 FRANKLIN.



DICK TEAGUE'S LATEST: A 1903 MODEL "A" FORD.

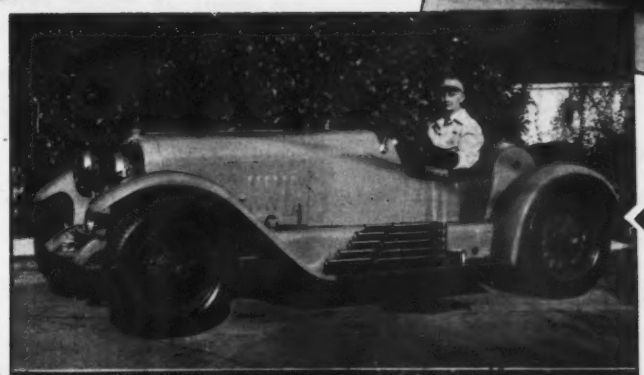
F. E. BISSELL, JR. DRIVING A 1911 INTERNATIONAL IN DUBUQUE, IOWA. OCCASION WAS CENTENNIAL PARADE ON SEPTEMBER 18, 1946.

ART AUSTRIA'S 1913 SEAGRAVE FIRE ENGINE. THE HUGE MOTOR IN THIS VEHICLE HAS A BORE OF OVER SEVEN INCHES. IT BELONGED FORMERLY TO THE SACRAMENTO FIRE DEPARTMENT.



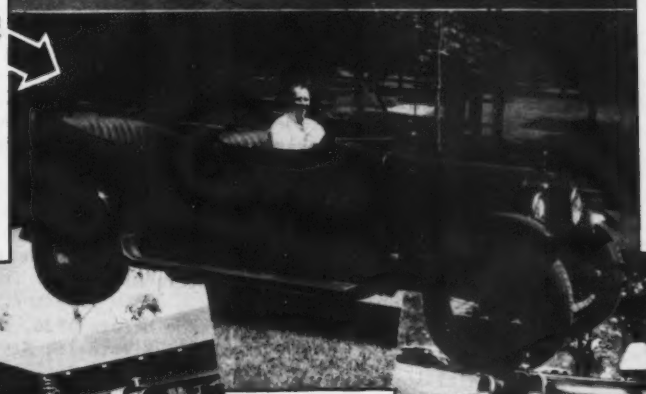
DUESENBERG MODEL J, OWNED BY LASSITER HOYLE. IT WILL DO OVER 90 M.P.H. IN LOW GEAR!

A 1912 PACKARD MODEL 30, 4 CYLINDER. THE PROUD OWNER, WILLIAM STEWART, RESIDES IN SHAWNEE, OKLAHOMA.



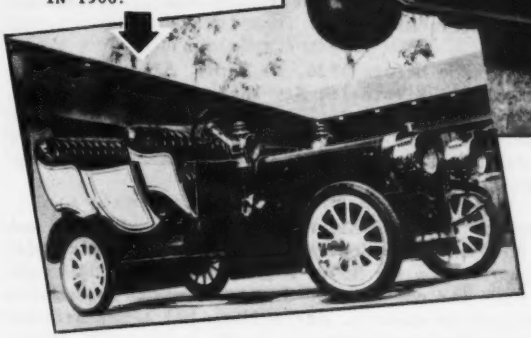
HERB ROYSTON AT THE WHEEL OF HIS 1920 MERCER

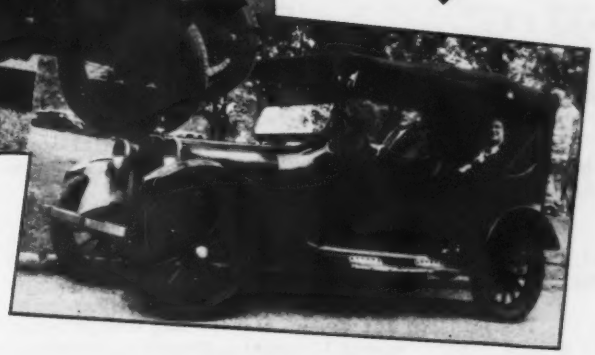
A 1916 PATHFINDER 12 OWNED BY BILL CAIN OF CEDAR RAPIDS, IOWA.

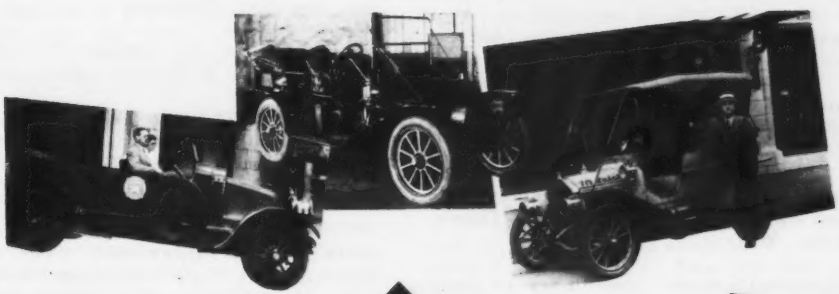


HERB RESTETSKY AT THE WHEEL OF HIS 1918 DODGE TOURING. IT LOOKS AS IF IT HAS BEEN EXPERTLY TAKEN CARE OF. THE OWNER, OF ST. LOUIS, BOUGHT IT NEW IN 1918.

LINDLEY BOTHWELL'S 1906 FORD 6, MODEL K. THESE CARS HAD 125 INCH WHEELBASE AND SOLD FOR $2500 IN 1906.







1912 RENAULT, OWNED BY STANLEY C. VANDYKE.

A 1908 CADILLAC OWNED BY KENNETH MUTCH, OF PORTLAND, OREGON.

A. M. SEMRAU, ORTONVILLE, MINNESOTA, AND HIS BUICK MODEL 10, 1908

REGARDING CLASSIFIED ADVERTISING

FOR THE

THE HORSELESS CARRIAGE CLUB GAZETTE

It has been customary to publish these ads free to Club Members, and we will continue to do so for a maximum of six (6) lines only. This amount of space is sufficient for ordinary hobby trading. In excess of six lines, a charge of one dollar will be made for a maximum of ten (10) lines. In scale from there on, it will be a dollar for each additional five (5) lines. For instance, fifteen (15) lines will cost two dollars -- twenty (20) lines, three dollars. For paid advertising, the first five (5) lines will be free, and one dollar additional for each additional five (5) lines. Members are cordially solicited to send in advertising and there will be no charge made for a maximum of six (6) lines. SO SEND IN YOUR ADS.

AN INVITATION

All members of the Horseless Carriage Club are cordially invited to visit Thompson Products Auto Album and Aviation Museum, Chester Ave., and East 30th St. Cleveland, Ohio. Over one hundred antique automobiles are on display. Ruth E. Swihart, Curator.

WANTED

Mercer raceabout, 1911 to 1914. Edw. J. Gorey, Walnut St., Greenfield, Massachusetts.

Want to buy or trade Pierce-Arrow catalogues, the older the better. George P. H. Riggs, 2204 Marathon St., Los Angeles 26, California.

Want Lock Ring for 30 x 3½ Q. D. Clincher rim to fit 1912 model 34 Buick. W. M. Parker, Police Dept. Willow Grove, Penna.

Transmission for Brush, or will buy complete car if priced right. Robert L. Gehrig, Grabill, Indiana.

Want 1930 - '31 or '32 LaSalle or Cadillac. Must be in clean and good condition. R, M. Studin, 446 So. St. Andrews Place, Los Angeles, California.

Want cars in good or restorable condition from 1897 to 1908. Walter Bittner, 1002 W. Washington St, Bloomington, Illinois.

Want old auto trade magazines or advertisements. Also catalogues and other literature. Daniel R. Filson, P. O. Box 52, Helena, Montana.

Starting emblem collection. Haven't any to trade but want to buy your duplicates. Cmdr. John K. Leydon, USN, Rte. 3, Pinecrest, Alexandria, Va.

WANTED

Want top bows for roadster or Ford model T tops. N. C. Ensworth, 215 23rd Av., No., St. Petersburg, Fla.

Want 6 cylinder Locomobile. Hamilton P. Greenough, 30 Tollis Av., Santa Barbara, California.

Pre-July '44 issues of THE BULB HORN to complete collection. P. S. de Beaumont, Box 3802, Cleveland 10, Ohio.

Old auto catalogues illustrating sports, foreign, and luxury cars. Also photos of your car. Have a large amount of trading material. John T. Robinson, 2500 52nd Av., No., St. Petersburg, Florida.

Bulb horns, also antique cars within 500 miles of Albany, N. Y., or St. Petersburg, Florida. Neil Ensworth, Canaan, New York.

Touring and sport cars prior to 1927, except Fords. Must be priced reasonably. Edward A. Moran, 3629 Oxford Av., Riverdale. New York.

Saxon 6, in fair or good condition. Melvin Fray, 3402 N. E. 32nd Place, Portland 12, Oregon.

1901 Rambler radiator, body, hood, windshield, shift and brake levers, foot pedals, lamps, lubricator, carburetor, water pump, floor boards. Bob Bruns, 1130 East 29th St., Los Angeles, California.

33 x 4" straight side rim, lugs attached. 1915 Studebaker Catalog, and 1906 Autocar catalog. Herbert Royston, P. O. Box 503, West Los Angeles 25, Calif.

Headlamp rim for 1914 Pierce-Arrow, pair of 9½" lenses for it, also radiator cap, preferably with the original radiator ornament. Several small bulb horns for use on early cars with tiller steer. Sidney Strong, Atwater, Minnesota.

Cars made before 1926, No Fords, Edward A. Moran, 3629 Oxford Av., Riverdale, New York.

License tags, name plates, automobiliana. Sale or trade. Write for details. Swigart Museum, Huntingdon, Pennsylvania.

Motor for Woods Electric automobile of 1906 and 1907. Automobile Handbooks for 1909, 1910, and 1915. I have duplicates for 1919, 1921, and 1922. Will trade two of mine for one needed. Stoddard-Dayton Automobile and instruction manuals, parts lists, or other printed material on Stoddard-Dayton. L R. Lohr, 1401 Ridge Ave., Evanston, Illinois.

Radiator and flywheel for 1909 Maxwell 2 cyl. B. Rademacher, 8769 Avalon Blvd., Los Angeles 3, Calif.

4 cyl. Stutz and HCS literature, catalogs, etc., 1914 Stutz electric brass cowl lamp. 4 cyl. Stutz wood wheel hub caps. 1913-14 Stutz 6 cyl. car. A. K. Miller, Montclair, New Jersey.

Model J Duesenberg. Would also like to obtain parts for one. Interested in hearing from Duesenberg owners. Will trade literature, pictures, and data on them. Gerald Strohecker, 2959 S. W. Montgomery Drive, Portland 1, Oregon.

WANTED (ctd.)

Model J Duesenberg. Would also like to obtain parts for one. Interested in hearing from Duesenberg owners. Will trade literature, pictures, and data on them. Gerald Strohecker, 2959 S. W. Montgomery Drive, Portland 1, Oregon.

Clean 4 cylinder touring car in the late teens or early twenties, preferably a Revere. Auburn speedster any year or condition. Duesenberg. Premier touring, '20's. I have a 1937 Cord and extra motor for sale or trade. Bob Graham, 1443 Jefferson, Kansas City, Missouri.

AVAILABLE

Complete official specifications for Rambler and Jeffery automobiles from 1902 through 1918 and data for Rambler, Jeffery, and Nash trucks from 1913 through 1919. John A. Conde, Public Relations Dept., Nash Motors, 14250 Plymouth Road, Detroit 32, Michigan.

FOR SALE

1915 V-8 Oldsmobile touring car, good mechanical shape & tires. Flock's Garage, Yountville, California,

Have five (5) new and nearly new 30 x 3 tires for sale or trade for what have you? T. C. Archibald, 409 West Park, Ontario, California.

1910 Overland roadster, details on request, R. W. Hardacre, 984 Fourth Av., Los Angeles 5, Calif.

20 photos old cars, 35¢. Magazines, Catalogs, Manuals. Model kits: Greyhound Super cruiser, 18½" long, $4.25; intra-city bus, $3.75; triple combination engine pumper, $3.00. Minature Autos, trucks, etc., American and foreign made. Edward A. Moran, 3629 Oxford Av., Riverdale, New York.

Just arrived---Scale model construction kits of English lorries. 15 distinctive models, easy to build. Details on request. Edward A. Moran, 3629 Oxford Av., Riverdale, New York.

1908-10 Hupp parts. 1910 Maxwell parts. 1907 Reo 1 cyl. parts. 1913 Cleveland. 1916 Haynes. 1914 Buick. 1921 Willys-Knight coupe. 30 x 3, 31 x 4, 32 x 4½, 33 x 5, 33 x 4, 28 x 2¼, 28 x 2⅜, 28 x 2½, 34 x 4, and 35 x 5 tires. Bernard Rademacher, 8769 Avalon Bl. Los Angeles 3, California.

Snap-on tire covers to fit most sizes of antique automobile tires. They are all new but some are slightly stuck together. Price 50¢ ea. while they last

Louis M. Paul, 1148 E. 77 St.

Los Angeles 1 Calif.

1913 Model "T" Ford touring and 1918 Chevrolet "490" roadster. Both need paint and tires and are in excellent condition for restoration. Also 1912 Flanders 20 roadster in excellent condition, complete with original instruction manual, and being driven almost every day. Motor number 74000. Will accept offers on 1902(?) Haynes—Apperson Carriage in good condition except tires and top. This is car no. J161. Dan R. Blythe, 202 West Chase St, Brady, Texas

FOR SALE ctd.

Acetylene Headlamps, $65 pair and up. Rushmores (small) $100; large Mercer type, $150. Oil side lamps $40 pair up. Tail lamps, $30; Brass horns complete with reed & tube, new, $45; others as low as $25. Brand new model "T" radiator, $50, brass. American Underslung 1915, 6 cyl., the sport car of its day, fine shape mechanically, $1500. 1913 Cadillac coupe, $1500 in fine shape. One cyl. Cadillac rear entrance car, $1200. One cyl. Reo, as is, $200. Buick White Streak rdstr., 4 cyl., needs work, $450. Franklin 1910 rdstr, complete except lamps, fine mech., $650. Buick '13 tour, tip top shape mech., new paint, all complete with top, windshield, speedometer, a beautiful job, $850. Haynes Apperson, about 1904, 2 cyl, needs work, $750. Two cars stored in museum in Duluth, Minn., - International tour., high wheeler, $800. Schacht high wheeler, rdstr, $800. Photos, 50¢ ea. Two bound vols. MOTOR for 1907 & 1908, complete with ads, $150 per vol. AUTO TRADE JOURNAL, 1908 and later, $6 ea. Arthur E. Twohy, 400 N. Kenmore Av., Los Angeles 4, California.

Large selection of 8 cyl., and DV-32 Stutz parts (chassis, engine, and body) at reasonable prices. P. S. de Beaumont, Box 3802, Cleveland 10, Ohio.

Have five (5) new and nearly new 30 x 3 tires for sale or to trade for what have youM T. C. Archibald, 409 West Park, Ontario, California

HORSELESS AGE boond volumes for 1901 and 1902, will sell, make offer. Mascots, and other parts to trade for your auto books and photos. John T. Robinson, 2500 52nd Av, N, St. Petersburg, Florida.

Automobile, truck, and motocycle pictures, 1910 to 1938. Model "T" Ford parts. Hayden Shepley, Apple Street, Essex, Massechusetts.

1911 Ford racer, has Roof 16 valve head, aluminum pistons, high-tension magneto, 3 to 1 gears, Houk racing wheels, 4 new 30 x 3½ tires and tubes. Many other extras. Bob Gehrig, Grabill, Indiana.

Several pairs of brass side lamps, several pairs of brass gas headlamps. 10 very fine bulb horns complete with reeds, tubes, and new bulbs. J. E. Vanderveer, 26 Emerson St., Kingston. New York.

Crawford touring car, 1912, in excellent condition. Good paint, clean and solid. Ran very little. New tires. Ready to run anywhere. Fine brass equipment.
Ford touring, 1914, in good mechanical condition. New tires, good top, brass equipment, (needs paint) clean and solid.
Ford truck, 1914 Martin-Perry open express body on regular chassis. Fine condition, good tires, new paint, and upholstery. All cars ready to drive away or will ship. Photos 10¢. Prices on request. These have all been reconditioned.
Tires, lots of old sizes, some brand new in wrappers along with tubes. Soft rubber. All kinds of T-Ford parts. 25 Black side lamps for Fords, 1916-21 new. 50 odd cranks. Buick 1912 Brass hub caps. Odd lot of Maxwell chassis parts for type with horn front spring. Pa. license plates all years. Many other items. Write.
MC KENRICK'S CYCLE SHOP, R.603 N. Center St. Ebensburg, Pa.

1930 Detroit Electric victoria sedan (looks like a modern gasoline car of same year). Good paint, excellent upholstery, and batteries in good condition with the exception of three (3) cells which need recasing. Charger included. Make offer, or what have you? Doyle W. Meanor, 3466 Wellborn St., San Diego, California. Phone Woodcrest 0248.

Sale or trade 1921 Olds V-8 roadster, clean car, new paint, good tires, new license. Joseph Bass, 3511 E. Magnolia Av., Lynwood, California, NEwmark 1-5479

Sale or trade high pressure tires, including large clinchers, exhaust chime whistles, magnetos, brass windshields, old lamps, Baydex spot lights, Pilot Ray road lamps. 150 pairs headlamp lenses. Old license plates. Radiator emblems, several hundred catalogs, Pair new 4 cyl. Willys-Knight fenders. Stanley condenser. Acetylene generators. Bulb Horns, New Stutz parts, including gaskets, mufflers, DV heads, and thermostats. 1923 Stutz 6 touring car. 1928 Stutz Blackhawk speedster. 1901 Locomobile Steamer. 1924 Stanley Steamer. 1916 Locomobile "48". 1916 Reo 4 cyl. touring. 1917 Overland touring. 1920 Cadillac Holbrook roadster. A. K. Miller, Montclair, N. J.

Ford model "T", 1914 or 1915. Brass radiator, good shape mechanically, no tires. Leslie L. Halverson, Route 1, St. Olaf, Iowa.

Studebaker coupe, 1921, actual mileage 4000. Chevrolet roadster, 1917 model 400. Stanley Steamer, 1917 touring. Walter Bittner, 1002 W. Washington St., Bloomington, Illinois.

Swap pair of Flintlock pistols or sell for $75. Ball and cap pistol, $25. Carriage lamps, $25 pair. 1915 Grant 4. Cyclecar of unknown make. 1913 White gasoline car. 1912 Hupmobile Roadster, or touring, $125 each. 1913 Ford touring, complete but needs tires and paint, $375. Apperson motor, $35. N. C. Ensworth, 215 23rd Av., No., St. Petersburg, Florida.

Boyce Motometers, $5.00 each. Neil C. Ensworth, 215 23rd Av., No., St. Petersburg, Florida.

1911 Buick 4 touring car, 18,500 original miles, Stored from 1936 - Sept. 1946, driven daily since. Purchased from original owner, A-1 shape, $275.00. Will Murphy, 8811 Lookout Mountain Av., Hollywood 46, Calif.

Auburn 12 model 161 convertible coupe. Runs fine, $375 or best offer (1933). This 45 degree Lycoming engine developed 160 horsepower. A stripped job was timed by A. A. A. at 118.3 m.p.h. May be able to furnish speedster body for $75. additional, not installed. William A. Johnson, Jr., 835 N. California St., Burbank, California.

Insure the antique automobile you use for meets. You should have Personal Liability and Property Damage. Special rates on fleets if you are only driver (you can't drive more than one at a time). E. F. Haven, Insurance Counsellor, 318 North La Brea Avenue, Los Angeles 36, California. Phone YOrk 2196.

Sale or trade, 1928 Rolls convertible sedan, modernized Brewster body. Crane-Simplex 1918 phaeton, good running condition. H. P. Greenough, 30 Tollis Av., Santa Barbara, California.

1915 Metz friction drive. Excellent mechanical condition and four brand new Firestone tires and tubes. 1919 Dodge sedan, recently overhauled and runs well, tires, top, and upholstery excellent. Albert A. Brouse, 2637 S. Hobart Blvd., Los Angeles 7, California.

Sale or exchange for steamer goods: American La France fire engine, 1914 vintage, in good condition with pneumatic tires on 24" wheels, $300. Cadillac 1931 sedan, six wheels, trunk rack, good for towing antique car or trailer, carry heavy load inside and out on scout trips, $200. Baker 20 h. p. boiler from Dr. Baker's test car chassis, $200.00 (or exchange for other steamer parts). Also brand new Pedric piston rings, small through large sizes---submit your exact size requirements in diameter, width, and thousandths oversize, 30¢ ea. prepaid, or exchange for steamer parts. 1937 cab imperial Cadillac sedan---twenty feet from front to back! Steam car conversion chassis in Los Angeles, all or parts. Also Doble E-19 in completely overhauled condition at owner's price of $2000 plus modest commission. R. G. McCord, 529 66th Street, Oakland, California.

Ruxtel two-speed rear axle for T Ford passenger car, complete with either (or both) large (for '26-27) or small (for 1910-'25) drum hubs, $27.50. Radiator for Ford "T" 1909-'16, buffed to high polish, clean and sound, scientifically oven-annealed to reduce possibility of age fatigue in metal, $25. Two pairs of 10" huge brass acetylene head lamps with 7½" heavy parabolic mirrors, made by Solar Co., off early Packard and Glide automobiles, oven annealed, and highly buffed finish, pair complete-$35; either pair without 7½" mirrors-$25. Heavy brass windshield off early Glide, in fine condition with thick plate glass intact, highly buffed finish, not annealed, $27.50. Very good live rubber 35 x 5 tires and tubes, casings 6 and 8 ply cord Hood or Mason brand, used only on antique car for one year, tubes; $1.00 to $2.00, casings; $3.00 to $8.00. Set of 34 x 4½ - 35 x 5 artillery wheels and six rims, Firestone brand, should fit any medium-large car with a little rework, rear wheels have spoke bosses, varnished dark oak finish, displaced from antique car now equipped with new Firestone in original size, $50.00. Front hub and spindle parts for E. M. F. 30, also rear hubs less brake drums. Two complete 33 x 4 - 34 x 4½ "Q.D." wheels, and two same size and kind less 3 bead rings and keepers, solid and sound, set-$22.50. Parts for early Packard "twin six" (V-12), assorted engine, transmission, and rear axle parts, good radiator, only $35.00. Also 1916 7 passenger touring body, fenders, frame, and top for above, all good, available if purchaser acts quickly. If prices are not satisfactory, make offer. Satisfaction on all of the above items as represented or money refunded upon return. L. S. Watson, 141 33rd St. Drive, S. E., Cedar Rapids, Iowa.

20 photographs, old cars, 30¢. Auto magazines: Horseless Age, Motor, Motor Age, Automotive Industries, automotive trade journals, etc., instruction manuals, sales literature. Have three model kits, all accurately detailed: Greyhound super cruiser---over 18½ inches long, $4.25; triple combination pumper - 16" $3.00; intracity bus, over 20" long, $3.75. Just received from England minature automobiles, trucks, racers, vans, etc., Also have American made autos, etc., Sale, or trade for other states, year for year, license plate of New York State. If you need parts to put your "antique" on the road, why not send me your list of parts wanted, I may have just what you need. Edward A. Moran, 3629 Oxford Av., Riverdale, New York.